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STATE OF NEW YORK

REPORT
OF THE
SEVENTH ANNUAL
CONFERENCE
OF
SANITARY OFFICERS



1907



New York State Department of Health

PROCEEDINGS

OF THE

SEVENTH ANNUAL

CONFERENCE OF SANITARY OFFICERS

OF THE

STATE OF NEW YORK

Held at Convention Hall, Buffalo, October 16-18, 1907



ALBANY
NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF PUBLICITY AND EDUCATION

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1908

New York State Department of Health

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Secretary and Deputy Commissioner

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**Proceedings of the Seventh Annual Conference of Sanitary
Officers of the State of New York, Convention Hall,
Buffalo, October 16-18, 1907**

The Conference was called to order by Ernest Wende, M.D., Health Commissioner of the city of Buffalo, Wednesday, October 16, 1907, at 2 p. m.

OPENING ADDRESS BY DR. WENDE

I have been requested by the Honorable Eugene H. Porter, Health Commissioner of this great State of ours, to call to order this Seventh Annual Conference of Sanitary Officers — a duty which to me is a great pleasure.

If Dr. Daniel Lewis, the Father of the Conference, were present, he would find in its development an agreeable surprise. The Conference now occupies a unique position in sanitation and it is composed of potent factors which often those most familiar with its achievements would fail correctly to estimate.

We, as health officials, impelled by a desire to co-operate in the execution of sanitary regulations, have come together to devise ways and means of advancing sanitary knowledge and widening the sphere of its application and to determine what methods and agencies should be encouraged, what avoided or reformed. At any rate we have assumed the position of a sanitary tower and it is clear that our destiny is to be wrought out in co-operation.

**ADDRESS OF WELCOME BY THE HON. J. N. ADAM,
Mayor of Buffalo**

As mayor of the city and speaking for all the people of Buffalo, I bid you welcome! It is a high bid I offer, in the highest possible terms, and the acceptance of it will afford us great gratification.

I greet you as Socialists of an exalted order, as advocates of the common good, as believers in the doctrine of 16 to 1, on the ground of the truth of the old adage that an ounce of prevention is worth a pound of cure! You come among us as children of wisdom carrying in your right hand length of days. You come among us, not to consider only the remedy for our physical ailments but to discover the causes of them, and by killing the cause to destroy the effect. We look upon you as our benefactors, and our gratitude is

voiced in my welcome. There is a disease which cannot be cured, for its seeds are planted with our birth. It is sometimes called "Anno Domini," but it may have an earlier or a later date of maturity and your efforts to have us get as great an extension of time as possible are highly appreciated.

Sickness is one of the great burdens of society, to the watcher as well as to the sufferer, and whatever can be done to prevent it ought to be done. Whatever can be done to prevent the inception of disease ought to be done. Whatever can be done to prevent its spread ought to be done. Whatever can be done to eradicate it ought to be done. Much has already been done to this end through the enactment of laws. The necessity of pure food, pure air, pure living has been recognized as a factor in the prolongation of life.

If these laws are schoolmasters to lead the people unto health they will have to be shown that it is the spirit of them that leadeth thereto, and that observance is essential to effectiveness. Get the people with you, gentlemen, get them to see that the work you are doing is in their interest and for their good and your task is easier. The people know that you are not seeking to make them healthier in order to make yourselves wealthier. They do not all know how wide the scope of your work is and how laborious it is, and I may add how little you get for it. There may be some drones in your departments who receive full compensation, but the years of close study required to fit the kingbees for their places are seldom taken into account. The quiet, steady, and necessary work in the laboratory is overlooked. The poring over microscopes, watching the growth and development of those organisms — what do you call them? Bacteria or bacilli or what? I have read that they are called germs in Germany, parasites in Paris, microbes in Ireland, and cultures in Boston, but whatever they are called, they need close attention and scientific knowledge if their subjugation is to be accomplished. Then the butchers and the bakers and the plumbers and the milkmen and the hucksters have all to be looked after, and even the doctors whose chief business it is only to cure, and many of whom you hope to put out of the business by preventive measures, have to be supervised. The inspection of school buildings and the examination of school children should receive more attention than has hitherto been given to them. But, gentlemen, I am not going to anticipate all the matters upon which you have convened to deliberate. I have already gone beyond the simple bounds of an address of welcome. I trust that your stay in

Buffalo will be pleasant as well as instructive, that your Seventh Convention will be better for you and for us, than any that has preceded it. The Mosaic Laws of Health stand unrepealed to-day. The Greeks subordinated theirs to physical beauty, the Romans to physical strength, Modern Europe has made progress in the study of hygiene, but I believe it remains for the United States of America to show to the world an example of the highest and best effort for the amelioration of human suffering and the promotion of human happiness in checking the ravages of disease by mastering it in its incipency, and I am sure you will nobly do your part.

ADDRESS OF WELCOME BY MR. WM. H. GRATWICK,
President of the Chamber of Commerce of the city of Buffalo

I feel unusually honored, in being given the opportunity of welcoming to Buffalo such a gathering as this is. Representing the Chamber of Commerce during the past three years, I have had the pleasure of addressing many important conventions which have come to this city, but I do not think that I have ever been called upon to welcome a convention that represented more important work for the general welfare than does this Convention here assembled to-day.

We here in Buffalo feel proud, and justly proud, of the results that our department of health has accomplished under Dr. Wende and his assistants. Buffalo is a better, cleaner, and more healthful city by reason of the untiring and faithful work done by our local health department; and speaking as a citizen, I sincerely hope that the results accomplished will, during the next few days, be brought fully to your attention.

Those of us who know industrial Buffalo are gratified at what we have to show, and at the results that have been accomplished during the past few years. We are located here at the end of the Great Lakes, the greatest inland waterway in the world, and we are also the western terminus of the Erie canal. We have cheap and almost unlimited electric power; and we have harbor facilities and shipping facilities unexcelled by any city in the world. We have had, during the past few years, a remarkable industrial growth. During the next few years we expect even greater development.

I should like to have every one of you gentlemen go up to the top of our new Chamber of Commerce Building and see the city from

this vantage point. You will see a large expanse of territory, a great many tall chimneys, and a good deal of smoke and soot. In that such an exhibit means industrial activity, we are proud of it, but in this connection I shall also ask you to look at the chimney of our own building. In this building we are furnishing heat, light, and power for a number of buildings and enterprises around us, and we are generating steadily over four hundred horse-power. I want you to see in this connection what can be done toward a cleaner city by modern methods. You can see what the result with us would be without such methods if you are fortunate enough to catch a time when they are changing from one machine to another. At such times, for a few seconds, a volume of smoke comes forth that is almost incredible, and it would be this way every hour of the day were it not for the precautions which we have taken.

This industrial progress of the past, and the industrial progress that we confidently expect in the future, mean an increased complexity in hygienic problems. You may feel assured, therefore, that as this city expects to become more than ever important industrially, we are in the same way more than ever interested in the work that you are doing.

Gentlemen, for the Chamber of Commerce, I extend to you a hearty welcome, and I hope that your stay here may be so profitable and enjoyable that you will all want to come again.

ADDRESS BY EUGENE H. PORTER, M.D.,
State Commissioner of Health

INTRODUCTION

A welcome so cordial, so generous, and so keenly intelligent renders it difficult to adequately express our appreciation. It is not a welcome of words alone, it is a welcome of deeds, for we all recognize the enthusiastic work that has been done by Dr. Wende and his associates and the public-spirited citizens of Buffalo, without which one-half of the influence and effect of this Conference of ours would never be attained. I think we can congratulate the city of Buffalo on its public-spirited mayor, on its efficient health officer, and on the intelligent co-operation of its citizens in sanitary work.

I believe that this welcome of yours, carrying with it the idea of efficiency in sanitation, will reach out through the State and be of the greatest educational value in our future work. Gentlemen, I thank you for your welcome.

ADDRESS

We are gathered this afternoon to inaugurate the Seventh Annual Conference of the Health Officers of the State of New York. This is a day of salutations. We are met here to greet a new Sanitary year, to welcome those who have come to join our ranks, and to exchange words of encouragement with one another. It is well that from time to time the principles that govern this Conference, the traditions that affect it, the aspirations that move it should court the fullest inquiry. For the Conference is to a great measure representative of the Department. That which moves the one, moves the other. If there is development and advancement here, there is you may be sure progress and fruitfulness there. But if our teaching has hardened into dogmatism, our precepts into formulas, and our system into routine, then is our custom a yoke, not of freedom but of bondage. We have fallen somewhat below our standards. For in our day we are restless, drawn by a discontent not always divine, dragged down by laxity, selfishness, and the tremendous materialism of the age. And besides all this there remains the monumental words of the first and greatest physician of western civilization,

"Life is short, and art long, occasion fleeting, experiment fallacious, and judgment difficult."

But while the road is difficult and advance not easily won, knowledge is greater, conviction clearer, purpose more resolute, and accomplishment nearer.

And so if our meeting here shall be a fresh incentive to continued labor, if it shall bear a particular and special message to each listening ear, and if, in addition to that comradeship so enjoyable, and that living sense of power through unity of organization so essential, it shall bring to each of us a more complete realization of the problems that confront us, a wider and keener mental vision, an inspiration leading to better public service, the purposes of this Conference will have been fully attained.

This is the largest gathering of health officers ever held in this State or for that matter in any other State in the Union, and that it is so is due to the untiring devotion to public duty and the constant enthusiastic interest in sanitary affairs always manifested by the Health Officers of the Empire State.

In greeting you this afternoon I find some difficulty in adequately expressing how much your presence here is appreciated and how fortunate we esteem ourselves that we have the opportunity to meet so many of our coworkers in sanitary matters.

The Conference extends its heartiest greetings to our good friends, the citizens of Buffalo. This splendid audience is an index of the public spirit and intelligence of the people of this municipality, and in sanitary as well as in other things Buffalo is certainly a city of the first class.

Some Special Department Work

It has seemed to me that the best use of my brief period of time would be to tell you some of the things we have done since the last Conference and then discuss briefly a few important matters that closely concern next year's work. So much has been done compared with anything we were able to undertake before that I can hardly do more than mention some of the many lines of endeavor entered upon.

1. THE INVESTIGATION OF SUMMER RESORTS

Has been continued and a large number of hotels have been personally inspected. The reports secured by the blank forms

sent out last year to the owners of summer hotels and boarding-houses have been thoroughly studied and tabulated, and where the conditions are unsatisfactory and possible or probable danger threatens visitors measures have been taken to correct the evils. The number of summer resorts in this State is enormous, and to properly supervise their sanitary condition requires more money than is now available. I hope next year, however, to approximately complete this work and so prevent many cases of "summer resort typhoid."

2. SANITARY INVESTIGATIONS OF VARIOUS CITIES

It is not enough to tabulate death returns. These melancholy statistics taken in bulk do indeed serve to remind us of "that bourne from which no traveler ever returns," but afford very little other information of practical value.

But when intelligently studied, they are employed for purposes of comparison and the results attained interpreted by the sanitary methods of to-day, they may serve as beacon lights pointing out existing danger and demanding its avoidance. So the dead shall speak to us, and these voices from the grave may not be lightly disregarded. And when it was found that in one of the cities of this State the average annual death rate from typhoid for ten years was 138 — in another 87 — in another 82 — in still another that the mortality from tuberculosis was three times what it should be, and in still another city the conditions indicated by the tables pointed unmistakably to an epidemic outbreak of disease, it needed no labored argument to convince me that one of the urgent duties right before the Department was the correction, if possible, of these conditions. And so we have begun this summer a sanitary investigation of the conditions existing in various towns and municipalities in this State. In this study were included the water supply and all possible existing sources of contamination; the method of disposal of sewage; the method of garbage disposal, if any; the chief occupations of the people; the number and kind of manufacturing or other industrial establishments; the number and character of tenement-houses; together with many other matters bearing relation to the general investigation. Some of these investigations are completed, others are still under way. When these reports are finally passed upon the Department believes that it will be able to give to each of these municipalities

specific and substantial aid in correcting the very serious existing dangers to health and life. It will not only point out the evil that exists but it hopes to be able to suggest the adequate remedy, and it will use all the influence and moral force at its command to effect a change for the better. But the Department does not undertake to do the required work. The town must work out its own sanitary salvation. The Department investigates, studies conditions, suggests, gives expert advice, points out the way. The rest of it belongs unmistakably to people dwelling where the conditions exist. And this, it would seem, is one of the most important functions of your department of health: to give to any town or municipality needing it expert advice and aid in the avoidance of sanitary perils and their speedy correction, if in existence. It will be readily seen that such work as this required much time and considerable expenditure of money. But we went as far as we could.

3. THE POLLUTION OF OUR STREAMS AND LAKES

This is one of the most important and difficult questions before us. It is obvious that a problem so serious, affecting so many and varied interests, must be dealt with in a broad and comprehensive fashion. As a basis for such treatment positive information is needed. It became, therefore, imperatively necessary to thoroughly study all the principal watersheds of this State. This work included the present pollution of streams, their suitability as sources of water supply, the wastes from factories and creameries, the refuse from pulp mills, and many other important facts. Sanitary maps have been prepared of many of these watersheds on a scale to show plainly each stream of appreciable size with the location of each source of water supply, and all important sources of pollution. The Oswego, Upper Hudson, Lower Hudson, Susquehanna, Genesee and Niagara watersheds are now practically completed.

4. EXAMINATION OF ALL PUBLIC WATER SUPPLIES

It has always seemed plain to me that one of the most legitimate functions of the State Department of Health was a continuous and efficient supervision of public water supplies. The work done by Massachusetts in this line has been most excellent and far ahead of anything we have ever been able to do. But the

increased appropriation in the supply bill rendered it possible to begin this important work, and every public water supply in the State has been examined and reported on. These examinations will be repeated at regular and necessary intervals, and where the supply is contaminated the cause will be removed as promptly as possible. Hand in hand with this work goes the

5. INVESTIGATION OF ALL SEWAGE DISPOSAL PLANTS

The value of a sewage disposal plant depends upon its efficiency. The quality of the effluent tells the story. So every disposal plant has been examined and every effluent has been analyzed. The results of these examinations will be used where indicated to better conditions.

6. EXAMINATIONS OF THE EYES AND EARS OF SCHOOL CHILDREN

Last year, you will remember, it was stated that the Department had in mind the institution of an examination of the eyes, ears, noses, and throats of school children. This, of course, was to be done with the co-operation of the Education Department.

I am very glad to announce to you that the plan proposed last year by Dr. Schenck, with some slight modifications, goes into operation this fall in 450 high schools of this State. As Dr. Schenck will tell you a little later just how all this is to be done, I will not go into details.

7. EXAMINATIONS OF NEW SERIES OF MEATS

The report of the laboratory on the first series of samples of meat products excited much attention and had a most excellent effect. A second series of samples of meats has been collected and examined, and the full report will be published in a short time.

8. ANALYSIS OF BEERS, ETC.

A large number of analyses have also been made of beers, wines, and whiskies, which will shortly appear in the Bulletin. No appropriation was made for these examinations, but it seemed necessary to make them, and the expense has been paid from the general fund.

9. TUBERCULOSIS EXHIBITION

Another line of special work undertaken this summer is the Tuberculosis Exhibition, the first ever owned by the State, and

the Hygienic Laboratory Exhibit, which is but the nucleus, it is hoped, of a much larger collection. The work of preparing these exhibits has been most onerous, the more so because of limited means, but the enthusiasm of Dr. Pease and his faithful assistants never flagged. It is our purpose to further perfect these exhibits, particularly the tuberculosis exhibit, and use it as a traveling exhibit for educational purposes. It is one of the things most sorely needed by the Department. Already we have received many requests from cities and towns to have it sent to them.

10. TRAVELING LIBRARIES AND BACTERIOLOGICAL OUTFIT

You will notice also in the exhibition here a collection of books and some apparatus for tuberculosis work. These are traveling outfits — the one a small collection of specially selected books on sanitation for the use of health officers, and the other a practical and always ready outfit for bacteriological work to be done on the spot where investigation and action are needed without delay. Although these things may not seem large, yet they are of no little importance because they will add materially to the efficiency of our work.

11. SPECIAL CIRCULARS

The very general interest now manifested by the more intelligent citizens of our country on sanitary matters is due not so much to the general advancement of scientific knowledge, by the arduous labors of students and laboratory workers as it has been to the dissemination of this increased knowledge. If these discoveries of truth never passed beyond the closed doors of our laboratories or could only be found between the covers of technical pamphlets, their influence and power for good would be as nothing. They would be mummified truths — embalmed but not available. Education then must continue to be the watchword. Education in sanitation spells progress in sanitation and no positive and decisive advance may be made until our fellow-citizens are educated to the point where they are generally convinced that the advance must be made. So we have determined to begin the publication of a series of circulars and pamphlets on topics vitally concerning the public health, for popular distribution. Work on the first series has already begun and the topics and dates of publication will be duly announced in the Bulletin. It will be a very modest begin-

ning, but we hope these little pamphlets will prove an important factor in our campaign of education.

What may be termed the first one of the series is the very complete and instructive prize essay by Dr. Knopf on the Treatment of Tuberculosis. This may be found at the registration office, and a copy will be given to each health officer attending the Conference.

* * * * *

These then, my friends, are some of the things we have tried to do since our Syracuse meeting a year ago. Of course in addition to these lines of work, the routine work of the Department, which has quadrupled during the last two years, has been going steadily on.

Appropriations

Efficiency and appropriations — the union of affinities, the one a complement of the other, married by general consent — let no Legislature put them asunder.

For it ought to be true, even if it is not altogether so as yet, that no appropriation of public moneys should be made without a definite expectation of efficient and honest public service in return. To the question "What is the expense of a certain line of work?" must be added the significant inquiry "What service has been rendered for that expense?" But there can be no service without means; there can be only inadequate service with insufficient funds; there can be efficiency in its fullest sense when the appropriation is enough to meet actual needs. The last Legislature increased the appropriation for our Department by almost \$42,000. The Governor allowed every increase asked for by the Department and stated that he did so in order to increase the efficiency. This increase of income has enabled the Department for the first time to begin lines of work that could not be undertaken before because of the expense. But the appropriation does not as yet, by any means, meet the requirements. The total amount of money available for the Department, exclusive of the Cancer Laboratory, is still less than \$100,000. We are still severely crippled in the amount allowed for "Investigations," for the "Division of Engineering," and for the "Division of Laboratory Work." I have no hesitation in stating that the efficiency of the Department is materially lessened and its administration hampered by lack of funds. Pennsylvania for the two years beginning June 1, 1907, has appropriated for its Department of Health — after the payment of the annual salary of the Commissioner, \$10,000, and the salaries of

numerous other officers, the sum of \$1,459,312 — \$400,000 of which is for "the dissemination of knowledge relating to the prevention and cure of tuberculosis." I may add that the appropriation made by Massachusetts also exceeds that of New York. All we want is enough to do thoroughly and well the work that lies before us.

Pure Food Law

The attitude of the Department regarding a pure food law was made so clear at the Syracuse Conference that it seems unnecessary to dwell upon the subject now. It perhaps is sufficient to say that the Department believes the State should have, without delay, a wise and practical pure food law, and that the enforcement of it should be placed in the hands of the Health Department.

The Cancer Laboratory

It is perhaps appropriate in this city of Buffalo, which contains an offshoot of the Laboratory Division of the State Department of Health, the Cancer Laboratory, for a few words to be said on the subject of this most serious and intractable disease. It might be well if we advised the citizens of the State not to put too much credence in the newspaper reports as to the curability or incurability of cancer.

The laboratory here has been working faithfully and well on the problem of determining a probable cause for the disease. It has not concerned itself with attempting to find a cure. Its work, therefore, may not be popular, but it is scientific, and in the end will accomplish more than would a search first in this direction and then in that, for possible remedial agents. When we have determined the cause of the malady, there is little doubt that a remedy will be forthcoming comparatively soon after.

It is true that deaths from cancer are increasing and the situation is a serious one, and the State has a right to impress its seriousness upon the laboratory here and urge that the money it appropriates shall show results.

In addition to exploiting various cancer cures, some newspapers have done considerable harm by publishing alarming articles on the contagiousness of cancer. Unfortunately the origin of those is to be found among some irresponsible members of the medical profession, who, not realizing the serious nature of their claims, and their far-reaching effects upon the general public, have drawn hasty conclusions from insufficient data, and

have published in the medical press their immature opinions, more than suggesting the contagiousness of the disease. Such an announcement is eagerly seized upon by the sensational press, and the public, already educated by the physicians and sanitarians to accept specific germs as the cause of cancer, and to recognize the infectious character of germ diseases, have proved fertile soil for the spread of the idea that cancer is contagious.

We need to let the public know that there is no sufficient evidence as yet that this is the case.

Public Health Diploma

In the spring of this year I received from the Secretary of the Medical Society of the State of New York, a copy of a resolution passed by the Society at its last annual meeting. The import of this resolution was that it was the opinion of the Society that only those physicians should be appointed as health officers who could show evidence of special training in public health work. I want to say that the Department is in hearty sympathy with the spirit of this resolution, and is very glad to recognize the interest manifested by the medical profession in this State in matters of public health. There are, however, practical difficulties which must be taken into consideration.

I take it that those who framed the resolution and were responsible for its passage by the Society, had it in mind to secure in this State the adoption of the method in vogue in Great Britain and other European countries, in appointing medical officers of health. Let us consider for a moment the requirements as they exist in Great Britain.

A candidate for appointment as a medical officer of health must be possessed of special qualifications, known briefly as the D. P. H., which stands for a diploma in public health. The examination for this diploma consists of two parts. Before the candidate can be admitted to part one of the examination he must be twenty-three years of age and have been a qualified practitioner of medicine twelve months, and after his graduation he must have had six months' practical instruction in hygienic chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man. This part of the examination covers the following subjects: 1) Physics, in their application to health, and with reference to ventilation and heating; water supply and sewerage. 2) Chemistry, in its relation to air, water, food, soil

and sewage. 3) Microscopical examination of air, water, food, articles of clothing and parasites. 4) Bacteriology, in relation to sanitary work.

Before admission to the second part of the examination, the candidate must show that after his graduation he has spent six months in acquiring practical instruction in the duties, routine and special, of public health administration under a medical officer of health in a community of not less than 30,000, and also has had three months' experience in a hospital for infectious diseases. The subjects embraced in part two of the examination are as follows: 1) Origin, pathology, and prevention of diseases, with special relation to infectious diseases. 2) Effects of unwholesome air, water, and food. 3) Diseases of animals in relation to the health of man. 4) Influence of occupation — unhealthy trades. 5) Influence of climate. 6) Sanitary administration in relation to requirements of houses and other buildings; sanitary engineering. 7) Construction, arrangement, and management of hospitals. 8) Statistics in relation to health. 9) Sanitary laws, including by-laws, orders, and regulations. 10) Duties of sanitary officers.

That every health officer should be possessed with the knowledge indicated in the above outline is a consummation devoutly to be wished. But under the present circumstances, it cannot be expected. In the first place, an investigation conducted by the Department has revealed the fact that there is not an institution in this State offering a course of postgraduate instruction covering these subjects. The prospectuses of the various medical schools show that hygiene and sanitary science are taught to students in their first or second years. The scope of the instruction is not as full as is necessary for the mental equipment of the health officer, if we are to put British standards in force; and, moreover, we all know from practical experience that the subjects taught in the first two years of a medical student's career are considered by him as very largely theoretical, and therefore of not sufficient practical importance for him to make really a part of his medical knowledge. If he retain sufficient to answer satisfactorily the few questions set by the State Board of Examiners, he considers he is doing well. Again, if opportunity were afforded for postgraduate instruction of the character I have outlined, it is a very serious question whether the recompense received by the majority of health officers would warrant them in going

to the expense of obtaining a special training. I want to say, then, to the medical profession in this State that these two practical obstacles must be removed before the Department can adopt for its own the rules suggested by the State Medical Society. As to the first obstacle, the Department intends to do what it can to provide some opportunity for instruction in sanitary science and public health. During the past year sanitary institutes have been held by the Department in various parts of the State which have afforded opportunity for the acquirement of increased knowledge on the part of the health officers. But we recognize that we have only scratched the surface. The Division of Publicity and Education, however, is seriously considering the problem, and I hope to be able a year from now to make an announcement at our next annual Conference of plans for some special courses of instruction for health officers and those desiring to become such. If the Department accomplishes this, the medical profession must do its part, and I believe this part can best be the removal of the other obstacle to which I have referred. The organized medical profession in this country has recently shown its power in the matter of fixing the recompense for services rendered, by forcing some of the largest life insurance companies in this country to restore the fee which was granted for examinations prior to the recent enforced retrenchment in insurance circles. I want to suggest that this same power of the organized medical profession can well and rightly be employed in securing adequate recompense for the health officers throughout the State. With very few exceptions, these public servants are miserably unpaid. They are the means of saving millions of dollars every year, and a fair premium on this saving would furnish adequate compensation for these faithful public servants. I would like to see the Medical Society of this State initiate a movement of reform in this matter, and I hope to learn by our next meeting that the subject has been well discussed in many medical circles. My answer, therefore, to the Medical Society of the State of New York, addressing me on the subject of requiring Evidence of Special Qualifications from Candidates for Appointment as Health Officers is, that the Department is willing and anxious to comply with the suggestion as soon as it is feasible to do so.

Typhoid and Pollution

A fact most gratifying to record is that, during the past two years, marked and increasing progress has been made in lessen-

ing the pollution of our rivers, streams, and lakes. That public sentiment is more and more actively supporting the position of the Department in this important duty is unquestionably due to the general dissemination of knowledge concerning the dangers of unrestrained pollution. It is a striking illustration of the fact that you must first educate and then advance. In some cases you educate by advancing. But in this matter, so far-reaching were its consequences, so many important interests, both public and private, were vitally interested, so many difficulties and peculiar embarrassments were in the way, that it was essential that the people should see as clearly as possible the imperative and urgent necessity for this sanitary reform before much progress could be made. That there is now throughout the State a general sentiment that our waters must be purified there can be but little doubt; when occasion arises it must be crystallized, specially informed, and wisely directed. It is needless now and here to again enter upon an elaborate discussion of the dangers of polluted and infected waters. If we estimate that 20,000 cases of typhoid occur in New York State in one year with 2,000 deaths, the money loss to the State is easily figured. Allowing each life to be worth \$3,000, a low estimate, as the young and vigorous are most often victims, and estimating that 15,000 of the 20,000 cases were men and were kept from labor forty days, and putting the value of a day's work at \$1.50, the total pecuniary loss to the State amounts to \$7,000,000. We know without telling what misery and suffering were caused by these thousands of cases, what grief and distraction occurred when death entered hundreds of homes; and to this must be added the very serious business loss of a community when the disease occurs in any way approaching epidemic form. Let us remember also the danger of infection by tuberculosis — a danger more serious and grave, I fear, than it is at present supposed to be. Then, too, when the stream is not infected the conditions of pollution existing cause a disfigurement of its natural features often peculiarly repulsive. The banks are covered with deposits offensive to both sight and smell; dirty and slimy scum floats on the surface of the stream and accumulates in eddies and coves; the bed of the river is covered with a viscid material that rises promptly when disturbed, and yields to the grieved nostril a pungent odor peculiar to itself. Fishing is impossible for there are no fish — boating, as a pleasure, is destroyed, the banks of

the river no longer yield enjoyment. The comfort and enjoyment of the people living along such a stream are impaired and sometimes totally destroyed. We are all agreed that such conditions should not continue to obtain. The policy of the Department remains as announced at Albany two years ago; that the continued pollution of our waters must cease. It does not expect this pollution will cease in a day nor in a year, but it does expect that within a comparatively short period it will be entirely stopped. When a given case of water pollution presents itself for consideration two questions arise which must be definitely answered before advance can be made. The first question is, what is the best and wisest thing to do in order to correct the existing conditions? And the second question is, how is it to be done? The first question the Department will always try to intelligently and comprehensively answer. To know what to do is perhaps the most important part in purifying our waters, and the Department feels it is a clear duty to furnish that information, if possible.

The answer to the second question will, it is hoped, correct a great amount of misapprehension as to the powers and duties of the State Health Department under the existing law. It is evidently not the present intention of the State to remove from localities, or the individual citizens inhabiting such localities, certain duties and responsibilities relating to health matters. Their powers begin, in most instances, where those of the Commissioner of Health end, and under the terms of the present health laws the reply to the second question must be: It must be done by the town or individual affected. In other words, in the majority of cases when the Department is appealed to for relief from water pollution or abatement of nuisances the Department may point out through its experts the proper way to correct these evils, but the town or individual must do the rest. If the town above on the stream is polluting the water seriously, the town below must take the active and legal steps, in the majority of cases, to have the nuisance abated. The Department may investigate, declare the existing conditions an intolerable nuisance, and report its conclusions, including the remedy for the evil, to both towns. But, in the majority of cases, that is as far as it can now go. The responsibility rests where it ought to rest in many cases, on the shoulders of the local authorities, who are much too willing very often to shirk their plain duty. It is as much

the duty of health boards to enforce the health laws of this State as it is that of the Commissioner of Health, and the local authorities of the towns of this State should shoulder their responsibilities and not attempt to place them elsewhere. The Department has no arbitrary powers in the matter of stream pollution. It cannot, in the majority of cases, directly order a town to take its sewage out of a stream, or direct it peremptorily to construct a sewage disposal plant. It can, of course, through the Attorney-General, appeal to the courts, but so can the towns and individuals in the majority of cases, and it is the intention of the law as it stands that they shall do so. I am not discussing the value or effectiveness of the present health laws. I am simply trying to make clear their practical working. In a number of cases the Department has no doubt been deemed very indifferent and ineffectual when it has done all the law permitted and stopped only because the limitations of the law compelled it to.

Tuberculosis

That tuberculosis was both communicable and preventable was as well known to sanitarians twenty years ago as it is to-day.

And it may be taken as a most striking illustration of the slowness with which knowledge filters down from the laboratory and the school to the profession and the public, that not until comparatively recently has such a realization of conditions obtained as to cause an imperative demand for the enforcement of preventive measures. It may be safely said now, I think, that it is an universally accepted fact that some kind of supervision is necessary, opinions only differing as to the extent of the supervision and the manner of its enforcement.

You will, undoubtedly, agree that there are at present some thousands of our fellow-citizens throughout the State in the early stages of tuberculosis who might, under favorable conditions, be kept among the living. I am not speaking now of advanced cases, who must inevitably be soon numbered with the dead, nor of those incipient cases receiving competent care, but of those who are entitled to treatment which they do not receive. Shall the State that houses, treats, and cares for both the acute and chronic insane refuse to consider the needs of those afflicted with tuberculosis? Are the blind, the crippled, and the epileptic to be given State aid, and the consumptive refused it? And it must not be forgotten the indigent consumptive in any stage of the disease,

unlike the wards of the State just mentioned, is a very constant menace and danger to those with whom he is living. If we admit then that the State should take some action the instant question arising is, What action?

It is indeed a most grave and difficult question, and a complete and thoroughly satisfactory answer is perhaps impossible to give at present, nor would I attempt at this Conference to suggest even a tentative policy for our State, were it not for the overshadowing importance of the subject and a clear conviction that some kind of action should be taken as quickly as possible.

You will remember Pennsylvania has an appropriation of \$400,000 for the dissemination of information regarding tuberculosis, its prevention and cure. Our Department has in the last supply bill an allowance of \$1,000 for the creation of a traveling tuberculosis exhibit. There will be practically no money left when that exhibit is fully completed. But if we go ahead with the courage of our convictions and demonstrate the efficiency of our plans the money to carry on the work will come.

In this campaign then, against tuberculosis, the following steps might be taken.

1. NOTIFICATION AND REGISTRATION

Without notification it is apparent that any real progress is rendered impossible. You cannot give aid to any consumptive until you know where he is, nor can it be known what help he requires until the case is properly reported and the conditions are described. Every physician in the State should promptly notify his health officer of any case of tuberculosis occurring in his practice, using for that purpose the cards and blanks already provided by the Department. The health officer in turn reports all cases to the Department. There is no publicity and all such returns are strictly confidential communications. This step was begun on January 1st of this year, and while the registration of cases has been fairly good, the step is as yet only half taken. To have it entirely satisfactory we must have the active and cordial support of the profession-at-large and more systematic work from some of our health officers.

2. THE ESTABLISHMENT OF DISTRICT STATIONS

The medical officers of the Department have been for some little time so selected that it is now possible to divide the State into

districts, each one having within its boundaries at least one medical officer.

At some central point in this district a station may be established in charge of the medical officer and should contain a supply of diphtheria and tetanus antitoxin, a bacteriological outfit, report cards and blanks, and a full supply of all the circulars and pamphlets issued by the Department on tuberculosis. The station would also contain outfits for the collection of sputum in order to facilitate an early and definite diagnosis. The station and its contents would be an educational center. The circulars would be for both physicians and the laity, and their distribution would be made by the medical officers and the health officers in the district. The circulars would be sent to the press and would undoubtedly be published. Addresses by health officers before medical societies and popular audiences, organizations of sanitary societies, the Sanitary Institutes of the Department, and the use in larger towns of our tuberculosis exhibit would all prove powerful and effectual factors in the fight against the Great White Plague. In this campaign of education the Department will endeavor, acting with the health officers, health boards, and public-spirited citizens, to organize anti-tuberculosis societies whose local influence and aid would be invaluable. For it must be steadily borne in mind that the greatest single factor in the winning of this battle is the constant and persistent dissemination of practical knowledge of the disease, its dangers and how to successfully combat it. You have doubtless noted that the proposed stations serve not only as centers from which tuberculosis may be fought but also as points where the antitoxin of the State Laboratory may be obtained and, in some cases at least, bacteriological examinations made. The necessity for the promptest possible distribution of antitoxin is obvious and needs no comment. It may be said, however, that the high cost of commercial antitoxin seriously interferes with the sanitary control of diphtheria among the better classes. Diphtheria which now stands fifth among diseases as a cause of mortality with 3,167 deaths yearly, will continue to maintain this position until sanitary authorities and the profession-at-large are as free to use it without restrictions as they now are to use ipecac or nux vomica.

In its bacteriological work the State Laboratory labors under these two disadvantages, namely: Physical inability to make speedy reports and lack of contact with the physician and health officer.

To obviate as far as possible the first difficulty, I have recently issued a notice to the effect that the reports upon the primary cultures from suspected cases of diphtheria and upon the Widal tests for typhoid fever be made by telegraph at the Department's expense. This will effect a saving in some instances of twenty-four hours in placing these reports in your hands, and will relieve health officers from the burden of paying for such services out of their own pockets as has heretofore been too often the case. It is not unlikely that a further saving in time can be obtained in the future by the improvement in the details of the transportation of specimens, such as, for example, a provision for the incubation of cultures while en route.

To obviate the second difficulty, to a slight extent at least, I have had prepared a traveling bacteriological laboratory which will be sent with a trained laboratory diagnostician to those communities in which problems specially difficult of solution arise in connection with these diseases. Already the State Laboratory has conducted one such field of investigation in an extended and uncontrollable outbreak of mild diphtheria with, I believe, excellent results.

But these provisions do not entirely overcome the difficulties or make the State routine bacteriological work the ideal method for the diagnosis of suspected diseases in the rural districts.

The local laboratory will always have its superior opportunities for the purely routine work. A movement has been started in this State by one of our most progressive health officers and his colleagues, and has resulted in the foundation of the Ontario County Laboratory at Canandaigua. The Legislature passed a bill permitting the county authorities to pay the salary of a county bacteriologist. The building and equipment for the work was generously donated by a public-spirited woman, and the small fees obtained for the examinations of a private character which are made pay at present for the incidental running expenses.

A plan of co-operation between this County Laboratory and the State Hygienic Laboratory has been arranged by the directors of both institutions. Assistance is given by the State Laboratory in connection with those technical procedures where operation in bulk tends toward economy. On the other hand, the County Laboratory reports all the positive results of the examination of cultures, sputum and Widal tests to the State Laboratory. It would seem most desirable that this plan be introduced in other sections of the State.

Whenever such a laboratory is established, the State Department will be prepared to make it a station of the Department as outlined above, supplying a certain amount of apparatus, and aiding its efficient operation in every possible manner. I am of the opinion, however, in the development of this new work that provision should be made not only for a permissive co-operation between the County and State Laboratories, but that the County Laboratory should be introduced into the public health service on somewhat the same legal basis as now applies to the relation between the local and the State health departments.

To this end I believe a bill should be introduced into the Legislature during the coming session, permitting the establishment of hygienic laboratories by counties or groups of counties, and for a proper relation to the State Hygienic Laboratory and the State Department of Health.

It will be seen at once, what added strength the establishment of laboratory stations would bring in the fight against tuberculosis.

3. STATE CAMPS FOR CONSUMPTIVES

And now what care should the State give to the thousands of cases of incipient tuberculosis needing help?

If any care is to be exercised, it is plain that it must be as simple and inexpensive as possible; otherwise the cost of caring for those people would be prohibitive. But we must always remember that we pay for them anyway. Whether we provide proper care or send them to almshouses and charity hospitals and thence to Potter's field, the expense is always ours. Remember also that every case removed to a suitable environment ceases to be a source of infection to his family, to his neighbors and the people in the streets.

I would advocate, therefore, the establishment of State camps for consumptives on State land. Plain board cabins should be erected, fashioned after sanitary plans. A little simple furniture should be provided. The inmates should be required to furnish, when able, all other furniture necessary. Such camps should have a resident physician and patients admitted only after proper and competent examination.

The results attained by such camps in other States and indeed in our own, have been most surprisingly gratifying and the percentage of cases cannot be exceeded. I do not forget the very admirable Raybrook Hospital and the fine results reached there, but the

State cannot, it seems to me, commend itself to the policy of erecting such expensive buildings and demanding large allowances for maintenance. The number of consumptives seems to be too great to carry out such a plan, admirable though it may be.

I believe that State camps instituted somewhat as outlined would produce the maximum of results at the minimum of expense.

4. LOCAL HOSPITALS

There still remain for our consideration the chronic, the hopeless cases of tuberculosis. What shall be done with them? Should the State go as far as I have suggested, it would very probably deem it well to stop there, at least for the present.

Nor ought the State to do all of this work. The cities and towns of this State have responsibilities and duties which they too must recognize. It must be their part to care for the chronic cases of tuberculosis. Just how this should be done is a matter for determination by the local authorities. There is no time here to enter upon a discussion of methods.

Some such policy as the one I have tried to explain to you should be at once adopted by New York. I have only been able to present the bare outlines and many important matters have not even been alluded to. All that has been planned could not, of course, be done at once even if funds were available. But even with the little we have, we can begin this work and if nothing prevents I propose to make the first move on the 1st of January, 1908.

The Public Service

He succeeds best who serves best. For success is service and the greatest hero is the greatest helper. The difference that existed between the noblest emperor of the Romans and the meanest royal profligate who ever occupied a throne is precisely the difference that obtains between great men and little men the world over. The one would advance the world; the other would advance himself. One would serve; the other would be served. The monuments made by printer's ink are but paper shafts that stand but for a moment; but he who writes himself upon the hearts of his fellow men has made an epitaph that shall endure for generations.

With every true man his work is first, his fee second — very important indeed, but still second. But in every walk in life there is a class ill-educated, cowardly, stupid. And with these,

just as certainly, the fee is first and the work second, as with the noble the work is first and the fee second. And this is no small distinction. It is, as Ruskin says, the whole distinction in a man; distinction between life and death *in* man, between heaven and hell *for* man. "Society," said Burke, in his "Reflections on the Revolution in France," "Society is indeed a contract. It is a partnership in all science; a partnership in all art; a partnership in every virtue and in all perfection. As the ends of such a partnership cannot be obtained in many generations, it becomes a partnership not only between those who are living, but between those who are living, those who are dead, and those who are to be born." With but slight changes in phraseology this beautiful and impressive statement applies with great exactness to our organization. It is for us, with great opportunities for efficient service before us, to bear this partnership into which we have entered constantly in mind. It lies with us to illustrate the meanness of an education which produces learned shirks or selfish skulkers, or to illumine the perfection of a rounded culture with the radiant light of devotion to humanity. If difficult problems confront us so much greater becomes the opportunity to solve them. If great obstacles are in the way the greater glory to remove them. The watchword is service. This it is that crystallizes our belief that enthusiasm and faith are the precursors of great deeds. As Dr. Van Dyke says, it impressively embodies our conception that the greatest success for a man, the only one at command, is to bring to his work a mighty heart. For it is more man that we need. Recent developments and discussion have driven us back upon the old, old truth — that only personality is the solution for the times — that all of the world's needs are embodied in its need for manhood.

About the plain and clear duties before us to perform we should have settled and fixed convictions. A man without convictions is a man of blubber. I do not say beliefs, opinions, views — all these are chaff in comparison. I say convictions so intertwined with his whole intellectual being, so coloring every thought, plan, purpose, labor, that they can no more be separated from them than his own existence can be separated from them. They should be seen and felt as powers wherever he goes; not because he is sounding a trumpet before him proclaiming their presence, announcing their glory, but because they are an inseparable part of his own personal character as the sun's bright-

ness is of the sun's. So shall we labor that what come to us as seed shall go to the next generation as blossom and that which come to us as blossom may go to them as fruit.

But in this fight in which we are justly engaged, the Empire State sends to us her message:

Have you heard it?

"On the night of July 2, 1863, after a bloody battle a council of war was convened by the commanding general. The corps commanders present expressed their views. Slocum, being the ranking officer in the council, was the last to reply. He said, 'Stay and fight it out.' Slocum was not an orator, but no orator made a better speech. It was brief like Cæsar's *veni, vidi, vici*, but it told the whole story. Stay and fight it out was the advice given by the council to General Meade, who was not satisfied with his position at Gettysburg. The army of the Potomac did stay and fight it out and the victory gained is the last comment that can be made."

That is the message of the Empire State — "Stay and fight it out." And on the unsullied surface of the scroll that shall record our advance during the coming year, first of all let us write across it in living letters of light the motto of this Conference —

"Stay and Fight it Out."

WEDNESDAY, OCTOBER 16, 1907

SECOND SESSION, 8 P.M.

THE DISSEMINATION AND CONTROL OF TUBERCULOSIS AS ILLUSTRATED IN THE BOVINE SPECIES

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There is perhaps no other subject related to public health that has given rise to such animated discussions, or to the expression of so many divergent views, as the one of tuberculosis. I need not point to the 5,000,000 victims it annually claims in all countries, or to the 13,000 or more human lives that the Empire State contributes to it each year, to show cause for this intense, widespread interest in it. You all know that there is no other disease which inflicts such deep wounds on mankind.

Although tuberculosis is one of the oldest diseases of which we have knowledge, its true nature was not revealed until its infectiousness was demonstrated by Villemin in 1865 and its specific cause discovered by Koch in 1882. It is from the latter date that real progress in its study began. With the incoming of its specific etiology there began a rapid outgoing of innumerable traditions concerning it. By the aid of its specific cause more has been learned about the disease itself and how to combat it during the last twenty-five years than the total efforts of the past centuries brought to us. This is important, for such rapid evolution of facts and methods are not compatible with the habits of human thought which have been handed down to us through generations. I mention this as a possible, if not a rational, explanation for the apparently slow progress which we are sometimes told is being made in preventing tuberculosis. We recognize indifference to the best efforts put forth to check its ravages, but we are sometimes slow in detecting the difficulties. We do not always recognize the effect upon the minds and hearts of the people of the sanitary regulations issued pertaining to this disease. Many of them are incompatible with inherited ideas relative to the proper

and humane care and treatment of the sick. More than this, it is difficult for the untrained in this science to recognize the operation of living organisms they cannot see or the necessity of heeding measures to intercept invisible forces. However, sentiment is giving way to reason and knowledge is slowly replacing opinion, and as a result wonderful progress is being made not only in the treatment of tuberculosis but also in building up a widespread and wholesome public sentiment for its elimination. This is the result of educating the people concerning it. When knowledge that can be comprehended and understood by the laymen is disseminated relative to the parasitic nature of tuberculosis, and the channels of infection are clearly indicated, it should require but a few short generations to make it a matter of history. I believe with Koch, that the war against tuberculosis is a conflict into which we may enter with a well-founded prospect of success. Strictly speaking, the fact that it is a preventable disease ought to have become clear as soon as the tubercle bacillus was discovered. Koch believed it from the beginning, and so will every one who convinces himself that this scourge of humanity rests in a tiny organism which cannot act injuriously to man unless it is allowed to enter his tissues, where it finds a suitable field for growth and operation.

The student of tuberculosis will recognize that in its etiology, development and spread it is one of the most ideal of parasitisms. Its specific organism is one of the highly developed parasitic bacteria. It does not, usually, destroy its host quickly but slowly. It kills because its growth in the tissues has destroyed organs or parts that are necessary to life. It spreads far and wide because the infected are not immediately seriously ill, but are able to go about spreading the virus, usually in their sputum. Thus we have in our schools, shops, stores and everywhere, those who are slowly but surely yielding to the supremacy of the dreaded tubercle bacilli. From certain of these cases in the beginning and early stages the virus is being disseminated. From the advanced ones which are giving off innumerable tubercle bacteria many more people are becoming infected.

If we inquire into the means of disseminating tuberculosis and methods for its prevention from the etiological point of view we shall find that the problem is not so difficult. The recognition of its specific cause is a tremendous aid in its control. It does away absolutely with whims, traditions and unfounded opinions.

It provides a definite, tangible living object to deal with. To overcome or check the natural course of a microscopic creation we have the intelligence and wisdom vouchsafed to man. To know the life history of the tubercle bacillus, its means of dissemination, and the effect of its multiplication upon its host is all the knowledge required. To prevent the spread of tuberculosis necessitates the applications of this knowledge to avoid the transfer of the virus from the infected individual to the healthy one. Its pathology shows the various means of exit of this organism — with the feces, urine, discharge from tubercular ulcers and abscesses, milk and sputum. These with the channels of entry circumscribe the means of dissemination. With the intervention of agents of destruction for the tubercle bacteria as they leave the infected person, or the separation of the infected from the healthy, cuts off completely the natural ability of the disease to spread. The whole problem of the control of tuberculosis consists simply in early diagnosis and the proper isolation or care of the patients.

It has so happened that the bovine species upon which man depends so largely for food is subject to a like parasitism. Bovine tuberculosis is to cattle what human tuberculosis is to mankind. As the conditions to be overcome in its elimination from cattle and mankind are practically the same, save for the sacredness of the life of the human patient, it seemed that a discussion of the status of bovine tuberculosis, especially its means of dissemination and methods of control, might be of interest.

It was originally believed that the germs producing tuberculosis in all mammals were identical. More recent investigations by Smith, Koch and many others, have shown that there are differences — morphologically, culturally and in their virulence — between the bacilli of human and bovine disease. The fact remains, however, that the literature contains about fifty cases in which the bovine type of tubercle bacilli have been found in infants and children. Some cases were fatal, others not. In addition to this there are several cases reported by direct, accidental, inoculation from cattle to man. The interim reports of the Royal Commission point out the frequency with which tubercle bacteria virulent for animals are obtained from human subjects. Dr. Theobald Smith has recently stated in a very instructive article on the channels of infection in tuberculosis, "I venture the statement that probably not more than 1 per cent. of all cases will show bovine bacilli, and that in individuals over twelve

years, they will be found only very rarely." However, these findings are sufficient to warrant the continuance of every reasonable effort to eliminate the disease from cattle. We do not want the milk from tuberculous cows.

Historically, bovine tuberculosis seems to have developed in Eastern Africa and Western Asia. From these centers it spread during the centuries to nearly every cattle-raising country of the world. At first its dissemination was slow, but during the last fifty years it has spread at a very rapid rate because of the great increase in cattle traffic. It is stated that in many countries, and in large areas within others, it did not exist until it was introduced within very recent years by the importation of tuberculous animals.

The dissemination of bovine tuberculosis is traced largely to, (1) the introduction of tuberculous cattle in the herd, and (2) by infecting the calves with separated milk from creameries where the milk from tuberculous cows is received. When once introduced it spreads in the herd by contact — licking each other's noses, drinking from the same watering trough, eating from the same manger — and the healthy calves drinking the milk of diseased cows. The avoidance of the purchase of infected cattle is very important. It often happens at both private and auction sales that infected animals are purchased and placed in healthy herds, thus sowing the seed of destruction. Russell* has pointed out a specific case in which an auction sale caused tuberculosis to be introduced into twelve previously uninfected dairies. The demands of cities for large quantities of fresh milk in winter is causing the dairymen to sell the dry and purchase fresh cows, thus enhancing the spread of the disease. In many local dairy districts it has been brought with the separated milk for feeding calves from creameries where milk from tuberculous cattle is received.

The amount of tuberculosis found in our food animals by the Federal veterinary inspectors is enormous. During the fiscal year 1905, there were inspected 6,134,388 carcasses of beef animals, of which 10,956 were condemned for this disease. The increase of tuberculosis in hogs is shown by the fact that in 1900, of 23,336,884 hogs that were inspected, 5,440 were affected sufficiently to cause a condemnation of some one or more parts of the carcass. In 1905, of 25,357,425 hogs inspected post-mortem,

* Bulletin No. 114, Wisconsin Agric. Exp. Station, Madison, Wis., 1904.

64,919 carcasses and 142,105 parts of carcasses were condemned for tuberculosis. It should be remembered that these condemnations were made on the inspection of hardly a third of the animals killed annually in the United States for human food. It is also important to note that these inspections were made on animals killed in our large packing-houses, and which were raised under the most favorable conditions existing in our country.

The extent and rapid increase of bovine tuberculosis in various other countries during recent years has caused alarm, both because of its effects in reducing the general food supply and its supposed danger to human health. The appended statistics taken from Bulletin No. 53 of the Bureau of Animal Industry are significant.

"The slaughter-house statistics of Prussia show 14.6 per cent. of the cattle and 2.14 per cent. of the hogs to be tuberculous. In Saxony the percentage is 29.13 for cattle and 3.10 for hogs. In the city of Leipzig, the figures are 36.4 per cent. for cattle and 2.17 per cent. for hogs (Siedamgrotzky). Of 20,850 animals in Belgium tested with tuberculin in 1896, 48.88 per cent. reacted (Stubbe.) Of 25,439 tested in Denmark from 1893 to 1895, 49.3 per cent. reacted; and of 67,263 tested from 1896 to 1898, 32.8 per cent. reacted (Bang). An examination of 20,930 cattle in Great Britain, either slaughtered and examined post-mortem or tested with tuberculin, showed 5,441, or 26 per cent. affected with tuberculosis. McFadyean estimates that 30 per cent. of the cows in Great Britain are tuberculous."

The report of the Minnesota Live Stock Sanitary Board for the year ending July 31, 1906, states that swine tuberculosis is on the increase and that it is now safe to assume that it causes an annual loss of \$70,000 to the State, through condemnation by the Federal meat inspection. I emphasize the increased amount of tuberculosis in swine, because it explains better than any other facts we have, the extent and rapidity of the spread of the disease from infected cattle. Tuberculous hogs come from dairy districts where they are fed the separated milk from creameries or allowed to run after the cattle while the latter are being fattened for the market.

The results of the various examinations and experiments relative to tubercle bacteria in milk show that about 2 per cent. of tuberculous cows have the disease localized in the udder. These animals are constantly giving off large numbers of tubercle bac-

teria in their milk, and the consumption of such milk would be exposing the consumer to great danger of infection. Of all tuberculous cattle in which the udder is not diseased, about 15 per cent. are found to give off tubercle bacteria in their milk at some time during the course of the disease. In these cases the milk is not constantly infected, but it is impossible to know when it may be so. The milk at any given time from this large percentage of tuberculous cows may or may not contain the dreaded organisms.

From the results of experiments conducted in the laboratory of the Bureau of Animal Industry, as well as from the majority of similar investigations, Mohler drew the following conclusions regarding the infectiousness of milk from tuberculous cows:

1. "The tubercle bacillus may be demonstrated in milk from tuberculous cows when the udders show no perceptible evidence of disease, either macroscopically or microscopically.

2. "The bacillus of tuberculosis may be excreted from such an udder in sufficient numbers to produce infection in experimental animals both by ingestion and inoculation.

3. "That in cows suffering from tuberculosis the udder may, therefore, become affected at any moment.

4. "The presence of the tubercle bacillus in the milk of tuberculous cows is not constant, but varies from day to day.

5. "Cows secreting virulent milk may be affected with tuberculosis to a degree that can be detected only by the tuberculin test.

6. "The physical examination or general appearance of the animal cannot foretell the infectiveness of the milk.

7. "The milk of all cows which have reacted to the tuberculin test should be considered as suspicious, and should be subjected to sterilization before using.

8. "Still better, tuberculous cows should not be used for general dairy purposes."

In order to appreciate the reason for the uncertainty of the presence of tubercle bacilli in the milk of tuberculous cattle, one must understand the pathology of the disease. In the bovine species the lesions are very liable to be localized in some gland or glands where they remain for a variable time, often through life, without becoming generalized. So long as the tubercle bacilli remain in these localized lesions, they do not appear in the milk.

The facts already set forth show that in the elimination of bovine tuberculosis there are difficulties not only from the sanitary

side but also from its great economic significance. The problem resolves itself into an inquiry into the best methods to follow under two distinctly different conditions, namely, (1) when the herd is free from tuberculosis and (2) when a greater or less number of animals are already affected. The same condition exists in the human species.

In preventing the entrance of a specific disease, it is simply necessary to keep out the microbe that produces it. The all-important question to consider in this connection is, how to keep it out. I have already mentioned the two most common channels through which tubercle bacteria gain entrance to a herd of uninfected cattle, namely, through the feeding of calves with the unsterilized milk from tuberculous cows and the introduction into the herd of tuberculous animals. The prevention by cutting off these channels of infection is not difficult nor expensive compared with the elimination of the disease if introduced or the loss it will occasion if it is allowed to remain.

To protect from the first it is simply necessary to sterilize the milk fed to calves unless it is known that the animals from which it came are free from this disease.

To remove the second danger, it is necessary to have the animals carefully examined and tested with tuberculin before bringing them into the herd. The tuberculin should be applied by a person competent to interpret* the results of the test and to see that all of the necessary conditions are complied with.

The Vaccination Method.—Since the discovery of tuberculin there has been an almost continuous series of investigations directed toward the production of immunity in cattle against tuberculosis.† Experiments have been made with tuberculin, with

* The interpretation of the temperature record requires care. If, however, all conditions pertaining to the protection of the animal have been fulfilled, the temperature curve mentioned is a very sure indication that the animal is suffering from an active, although it may be a very small, tubercular growth. If there is no reaction the correct interpretation is more difficult. In this case there are three conditions which must be taken into account, namely: (1) If the animal is extensively diseased it may not react. (2) If the test was made during the period of incubation there would be no reaction, although the disease may soon develop. (3) It is known that cows which have reacted may, because of the arrest of the disease, fail to react subsequently but later the disease would start up again, when the animal would react. We have records of several cases of this kind. Great care must be exercised, therefore, in the interpretation of negative results, especially in tests in herds where tuberculosis exists and where it is possible that the animals failing to react have been infected.

† For a full discussion on immunization against tuberculosis see an article on "Immunization of Animals against Tuberculosis," by Dr. Leonard Pearson, second annual report of the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis, Philadelphia, 1905.

the new tuberculin of Koch, with serums of various kinds, and with dead tubercle bacteria. The most energetic efforts have been made in the production of a vaccine, consisting of attenuated tubercle bacteria from cattle, or man, or of the avian variety. Space will not permit of a discussion of the experimental work, but suffice it to say the results thus far are not very satisfactory.

Pearson has succeeded in immunizing cattle against tuberculosis, but as yet the method is not practicable, although he feels that it may become so.

The bovovaccine of von Behring is still in the experimental stage. Many calves have died of pulmonary embolism and the development of tubercular lesions have occurred following its use. There are, however, a few reports of satisfactory results. The method proposes to immunize cattle for several years at least, and consequently reports that cover experiments of only a few month's duration or a year at the most do not carry conviction as to the efficiency of the method.

Von Behring* has more recently spoken encouragingly of bovo-vaccine or the Jennerization method and also the new product known as tulose which he has obtained from tubercle bacteria. With this he has succeeded in immunizing against living tubercle organisms. This method is known as Mithridatization. He also feels that a passive immunity may be obtained by the use of serums.

While we hope that the experiments will prove successful and great assistance will come from vaccination in the fight against tuberculosis, we cannot look to it for assistance for our immediate needs. The biological principles underlying the processes of immunity are not especially encouraging for the disease in cattle. As vaccinations have for their purpose the immunization of healthy animals, it seems more logical to protect the herds against infection, and thereby avoid any necessity for increasing resistance. The value of the vaccination method, if successful, lies in the immunization of the calves in tuberculous herds, thereby making it possible to build up a sound herd from tuberculous stock.

The Handling of a Tuberculous Herd.—Where the cattle are free from tuberculosis, the method of prevention is simple and inexpensive. But where the disease already exists in a dairy, to a greater or less extent, the problem is far more trying. It is clear that a dairyman cannot afford to have tuberculous cattle,

* British Medical Journal, September 8, 1906, p. 577.

and it is a fact that many of them possess such herds. The question, therefore, is, how can a man who has tuberculous animals eliminate the disease with the least loss? Two methods have been proposed and tried, namely, the immediate eradication by slaughter of all diseased animals and, secondly, the application of the Bang method.

The eradication of the disease by destroying all infected animals was the first proposed and extensively tried. It was based upon the great sanitary significance of the disease rather than upon the disease as a destroyer of cattle. It anticipated State aid for payment for the condemned animals. It failed because the disease was found to be so widespread that appropriations to carry out the method could not be secured from the Legislatures. As carried out, the method also failed of permanent good because it did not provide for retesting the remaining animals and thus finding and eliminating the infected individuals in which the disease was in the period of incubation at the time of the first test and slaughter. More than this, it called for an unwarranted destruction of property in cases where fat animals that proved to be very slightly infected were destroyed.

The Bang method for handling tuberculosis is simply the procedure recommended and carried into effect in Denmark by Prof. Bang of the Copenhagen Veterinary College.*

The object of this method is to replenish a tuberculous herd with as little loss as possible. It requires that all animals which show physical symptoms of the disease shall be destroyed. Those which give a tuberculin reaction but which, on physical examination, exhibit no evidence of their being tuberculous are isolated. They are kept for breeding purposes. The reacting animals are carefully watched and if any of them develop obvious symptoms of the disease they are slaughtered. The stables from which the diseased animals are removed are thoroughly disinfected.

As the sound herd is built up, the isolated cattle may be fattened and killed, under proper inspection, for beef. The laws of nearly, if not all, countries permit the use of meat of tuberculous animals for food when the disease is localized. In this way the people of Denmark have been able to greatly reduce the

* Bang, B. The struggle with tuberculosis in Denmark. *The Veterinarian*, Vol. LXVII, 1895, p. 688. Tuberculosis of cattle. Penn. Dept. of Agric., Appendix Bull. 75, 1901.

very high percentage of tuberculous cattle and at the same time minimize the loss they formerly sustained by the frequent deaths of diseased animals.

The Bang method, modified to suit the local conditions, has been applied with great success in Hungary, where the reports show that many highly infected herds have been freed of the disease in from four to six years. In Norway and Sweden the results have been equally good. Prof. Regner* states that the percentage of reacting animals among 36,149 cattle was, at the beginning of the application of this method, 33.6 per cent. After a period of from two to nine years, in different herds, it has been reduced to 4.7 per cent.

Among the first, if not the first, to put the Bang method to a test in this country was the Wisconsin Agricultural Experiment Station.† They begun in January, 1896, with sixteen reacting animals and eighteen healthy cattle. In February, 1899, they had twenty-seven healthy animals, all the progeny of the group of tuberculous cattle. Russell pointed out at the time that the method afforded a practical and often a most desirable way to replace a tuberculous herd. The method has been successfully applied at the Geneva Experiment Station.‡ October, 1901, the test of the herd showed thirteen healthy and seventeen tuberculous animals. They were separated and the method carried out. The station suffered a loss of four healthy animals in a fire, and a small number of heifer calves were born; but with all the disadvantages, in December, 1905, the herd numbered thirty sound animals and six tuberculous ones. The latter were slaughtered. Of the six, three would have passed the Federal inspection and their beef value obtained had they been disposed of in that manner.

The method is being applied most successfully by a number of cattle owners in this State. I personally know where it is being followed in herds aggregating more than a thousand animals. These infected dairies are gradually, and in some instances rapidly, becoming free from the disease.

* Regner, Gustav. The suppression of tuberculosis among domesticated animals. Eighth International Veterinary Congress, Budapest, Sept., 1905.

† Russel, H. L. The history of a tuberculous herd of cows. Wis. Agric. Exp. Sta., Bull. 78, 1899.

‡ H. A. Harding, Geo. A. Smith and V. A. Moore. The Bang method of controlling tuberculosis, with an illustration of its application. Bull. No. 277, N. Y. Agric. Exp. Sta., Geneva, N. Y., 1896.

THE STATUS OF BOVINE TUBERCULOSIS IN NEW YORK STATE

Although facts about tuberculosis are generally interesting, I feel that we are called upon to consider more definite and concrete sections of the subject. As health officers of the Empire State, what is the condition respecting tuberculosis of the dairies furnishing milk to your citizens and of the cattle and hogs providing the home killed beef and pork?

Unfortunately there are no reliable data sufficient to estimate the extent of bovine tuberculosis in this State. The secretary of the former Tuberculosis Commission of the State Board of Health, estimated that about 4 per cent. of the cattle were affected. Of 1,459 animals examined and tested with tuberculin by the State Department of Agriculture up to 1906, Dr. Kelly tells me that 641 or 43.9 per cent. reacted. These herds, however, were all under suspicion and consequently this high percentage of reacting animals could not be considered as representing the condition of the herds generally.

In order to obtain further data on the subject, I addressed a letter to a large number of practicing veterinarians* asking for definite information on this subject. In response I have received a large number of positive statements from practitioners relative to the herds which they have tested in their practice within a period of three years or less. The greater number were made during the last year. In addition to this, the Chief Veterinarian of the Department of Agriculture has kindly furnished me with a list of the official tests that have been made during the last three years, 1904-1906. These two groups of statistics are interesting, because the official tests have been made under the operation of the law in herds under suspicion, while many of the private ones were made where the disease was not suspected by the owner, but because it was required by the purchaser of animals or of milk and its products. It is true, nevertheless, that many of the private tests were made because of the suspicion of the owner or at the suggestion of the veterinarian.

From the total of the individual reports, I have arranged the facts in the appended table (Table I) by counties which gives,

* I desire to express my appreciation and thanks to these veterinarians for their prompt replies and the valuable information they contained. It should be stated that many of the veterinary practitioners of this State are doing pioneer work of great value in trying to teach the farmers the necessity for good results of eliminating tuberculosis from their herds.

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in addition to the number of animals tested, some idea of the distribution of the herds from which the data were obtained.

In Table II will be found the facts similarly arranged of the official tests of the State, kindly furnished me by the chief veterinarian.

TABLE I.—A TABLE GIVING THE RESULTS BY COUNTIES OF TUBERCULIN TESTS MADE BY VETERINARY PRACTITIONERS, 1905-1907.

COUNTY.	Number of herds tested.	Total number of animals.	Number of animals that reacted.	Number of tuberculous herds.	Number of herds free from tuberculosis.
Allegany.....	11	169	2	1	10
Broome.....	1	34	10	1	0
Cattaraugus.....	14	227	21	9	5
Cayuga.....	4	44	13	3	1
Chautauqua.....	11	429	46	10	1
Chemung.....	17	241	82	14	3
Chenango.....	15	174	44	11	4
Cortland.....	10	192	54	8	2
Delaware.....	26	1,030	553	23	3
Dutchess.....	21	629	287	18	3
Erle.....	17	817	340	13	4
Fulton.....	3	74	8	3	0
Genesee.....	1	12	3	1	0
Herkimer.....	4	90	65	4	0
Jefferson.....	4	63	30	3	1
Lewis.....	2	45	18	2	0
Livingston.....	5	155	20	3	2
Madison.....	6	62	21	4	2
Monroe.....	6	80	11	4	2
Nassau.....	1	15	5	1	0
Niagara.....	2	16	4	2	0
Oneida.....	5	73	36	5	0
Onondaga.....	1	18	14	1	0
Ontario.....	3	134	80	2	1
Orleans.....	3	9	0	0	3
Oswego.....	8	169	56	6	2
Putnam.....	4	46	29	3	1
Rockland.....	16	231	50	11	5
St. Lawrence.....	13	266	124	13	0
Schoharie.....	4	68	26	3	1
Seneca.....	5	228	64	1	4
Steuben.....	16	140	16	6	10
Tioga.....	17	334	35	15	2
Tompkins.....	24	306	13	6	18
Washington.....	1	84	5	1	0
Wayne.....	6	52	16	5	1
Westchester.....	28	1,242	673	24	4
Wyoming.....	16	250	39	13	3
Totals.....	364	8,640	3,111	265	99

A study of this table will show that tuberculosis is widely distributed in New York, and that there is considerable activity regarding it. The results of these private tests are most interesting. Of the 8,640 animals tested, 3,111 or 36 per cent. reacted. Of the 364 herds tested, 265 or 72.8 per cent. were infected, leaving but 27.2 per cent. of the herds examined free from this disease.

TABLE II.—A TABLE GIVING THE RESULTS BY COUNTIES OF TUBERCULIN TESTS MADE BY THE COMMISSIONER OF AGRICULTURE, 1904-1906.

COUNTY.	Number of herds tested.	Total number of animals.	Number of animals that reacted.	Number of tuberculous herds.	Number of herds free from tuberculosis.
Albany.....	1	5	0	0	1
Allegany.....	7	68	2	2	5
Broome.....	5	44	6	1	4
Cattaraugus.....	9	123	10	4	5
Cayuga.....	2	20	7	1	1
Chautauqua.....	14	59	5	5	9
Chemung.....	9	72	6	5	4
Chenango.....	9	110	25	5	4
Columbia.....	15	140	44	5	10
Cortland.....	7	75	25	3	4
Delaware.....	6	186	9	2	4
Dutchess.....	2	38	24	1	1
Erie.....	5	341	8	2	3
Essex.....	5	48	5	2	3
Franklin.....	12	68	6	2	10
Fulton.....	1	3	0	0	1
Genesee.....	2	16	3	1	1
Greene.....	3	54	7	3	0
Herkimer.....	7	37	18	4	3
Jefferson.....	7	119	36	3	4
Lewis.....	1	14	1	1	0
Livingston.....	1	5	2	1	0
Madison.....	3	47	26	1	2
Monroe.....	2	12	0	0	2
Montgomery.....	1	2	0	0	1
New York.....	2	81	3	1	1
Niagara.....	2	4	0	0	2
Onondaga.....	4	43	18	2	2
Ontario.....	1	1	0	0	1
Orange.....	8	65	25	5	3
Orleans.....	1	12	0	0	1
Oswego.....	7	96	39	3	4
Otsego.....	12	163	57	8	4
Rensselaer.....	10	103	17	5	5
Rockland.....	2	9	0	0	2
St. Lawrence.....	31	378	161	21	10
Saratoga.....	2	23	0	0	2
Schenectady.....	2	6	2	2	0
Schoharie.....	1	1	0	0	1
Seneca.....	3	15	0	0	3
Steuben.....	9	52	7	2	7
Suffolk.....	2	4	2	2	0
Sullivan.....	2	4	3	2	0
Tioga.....	4	34	7	3	1
Tompkins.....	5	52	1	1	4
Ulster.....	1	45	27	1	0
Warren.....	1	4	0	0	1
Washington.....	3	49	1	1	2
Wayne.....	3	22	1	1	2
Westchester.....	8	116	27	7	1
Totals.....	262	3,088	673	121	141

A study of the facts set forth in Table II is very instructive, as it shows that the official tests made on supposedly diseased herds revealed a much smaller percentage of reacting animals, and a much larger proportion of uninfected herds than was found by the private tests. Of the 3,088 animals tested, 673 or 21.79 per cent. reacted, and of the 262 herds tested, but 121 or 46.18 per cent. were diseased, leaving 53.82 per cent. uninfected.

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If we take the totals of the private and official tests we have positive information concerning the condition existing at the time in 626 herds, including 11,728 animals. Of the 626 herds, 386 or 61.7 per cent. contained tuberculous animals. Of the 11,728 cattle tested, 3,784 or 32.26 per cent. reacted. Of the 11,728 animals, 2,475 were in 240 herds that were free from the disease. The total number of cattle in the 386 herds containing reacting animals was 9,253, of which 3,784 reacted. This gives us 40.89 per cent. of animals infected in the diseased herds. The average size of the diseased herds is 23.9 animals and the average size of the uninfected herds is 10.3 animals.

It is unfortunate that more knowledge on this subject is not available. The data already given show that it is widespread. Although the figures point to a very high percentage of infection in the herds examined, the fact must not be overlooked, that the total number of animals tested and herein considered represents but a little more than one-half of 1 per cent. of the cattle in the State. It is clear that general deductions should not be made from the condition found in such a relatively small number of animals, but the inference is justifiable that the dairy herds are quite generally more or less seriously infected.

What is being done with the reacting animals in private tests is not known, but casual inspection of a few slaughter-houses during the killing hours show that not a small number of them find their way to the shambles. A few dairymen are resorting to the Bang method to restore their herds. In some localities the local regulations of the Board of Health forbid the sale of the flesh for food of tuberculous animals regardless of the extent of the lesions. In others no action has been taken and the butchers throw away as much meat for disease as their consciences direct. There is a painful lack of uniformity or system observed by the health authorities in the State for the purpose of controlling this disease in the animals furnishing milk and the locally dressed meat.

With the present Federal meat inspection of carcasses for interstate trade, it is very desirable to have a State meat inspection service established for animals killed within the State. This is necessary at present, if the public is to be safeguarded against meat from advanced cases of tuberculosis. Pennsylvania has recently established such a service, administered under the authority of the State Live Stock Sanitary Board. It provides for ten inspectors, and veterinarians have been appointed. These men

can inspect the slaughter-houses, and be present when animals known to have reacted to tuberculin are to be killed. The mere knowledge that an official inspector is liable to visit a slaughter-house at any time with authority to seize any and all diseased or unwholesome meat, has a most beneficial effect upon the butcher.

The necessity of such a service in this State is very evident. A campaign against bovine tuberculosis, which is already beginning, demands an equitable disposition of the reacting and rejected animals. As large numbers of them are suffering with localized and very slight lesions, it is very proper that they be retained for food. It is just as desirable that the cases of advanced and generalized tuberculosis be excluded from our meat markets. It is not entirely satisfactory to leave the decision to the untrained butcher, who is usually financially interested in the carcasses.

With the 1,826,000 milch cows, and 944,000 other cattle in the State more or less affected with tuberculosis, many of the unfortunate individuals will be slaughtered for food. Such is being done at present, and as interest in the elimination of tuberculous animals becomes more general, the number of such infected cattle that will come to the butcher's block will undoubtedly be greatly increased. In addition to the question of tuberculosis, there are many other diseases and diseased conditions found in the carcasses of food animals that should be guarded against. A satisfactory meat inspection service calls for municipal slaughter-houses for all cities in order to better care for the business and to reduce the number of inspectors.

The pathological principle involved in the weeding out of tuberculous animals is simply segregation, and the protection of the uninfected. Those that are infected will recover or die, according to their ability to resist. In either case they lose the power of disseminating the virus. What is true for cattle is true with men. Public sentiment must be educated to a realization of the necessity of carrying out the measures for segregating the advanced cases, and of requiring the others to form such habits that they will not expose the healthy. If these measures are by some thought to be inhumane, it would be well for such to learn the "tenderness of cruelty."

Finally, there are practitioners in comparative as well as human medicine who are not willing to apply methods of precision in diagnosis. When tuberculosis can be determined from physical symptoms alone, much harm usually has already been done. The

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success of the Bang method rests in the searching diagnostic value of tuberculin. The checking of human infection depends upon early diagnosis. Tuberculosis is a great destroyer of life, and like other injurious things it will disappear when people learn to avoid it.

COMMISSIONER PORTER — We have known for many years that consumption is both preventable and curable, but it is only as of yesterday that we, as a people, have begun a general campaign against the fatal ravages of this plague. One of the most important meetings perhaps that will be held in the coming year will be that of the International Tuberculosis Congress, to be held at Washington. It will, perhaps, be of some interest to you to know what position our State will take at that meeting. And so, with your permission, I will read to you the following letter from Governor Hughes:

State of New York — Executive Chamber,

October 2, 1907.

HON. EUGENE H. PORTER, *State Commissioner of Health,*
Albany, N. Y.:

Dear Sir:—I have been requested by Dr. John S. Fulton, Secretary General of the International Congress on Tuberculosis, which is to be held in Washington, D. C., from September 21 to October 12, 1908, to procure the participation of this State in the movement to prevent the spread of tuberculosis, which is represented by the International Congress.

The importance of this movement cannot be overestimated. It appears from the statement you have furnished me that upwards of 50,000 cases of tuberculosis exist in the State of New York to-day, of which at least 20,000 are outside of the city of New York. It also appears that the annual average mortality in this State from tuberculosis has been for the last ten years 13,441. The work which the State has undertaken for the treatment of incipient pulmonary tuberculosis at the Raybrook Hospital has had most gratifying results; and from the statistics of the hospital it appears that a very large percentage of the cases receiving proper treatment in the early stages are susceptible of cure. Not only humane motives, but economic considerations urge every effort to prevent the spread of this scourge.

In order that the State may be properly represented at the coming International Congress, I ask you, in accordance with Dr. Fulton's request and with the suggestion contained in your letter of recent date, to prepare a suitable State exhibit.

I have also requested the State Department of Agriculture,

the Agricultural Experiment Station at Geneva, the State Veterinary College at Ithaca, the State College of Agriculture at Ithaca, the State Hospital for Incipient Tuberculosis, the State Department of Education, the State Prison Commission, the State Commission in Lunacy, the State Department of Labor, and the State Department of Charities to designate members of their staffs, so far as may be possible within their respective appropriations, to aid you in the collection of suitable materials for the State exhibit. Copies of the letters sent to these various departments are inclosed herewith for your information.

It is desirable that the municipal divisions of the State, so far as possible, should be represented in the Congress. I request you, therefore, to communicate with local health boards and officers regarding the matter and to invite their co-operation and that of scientific and medical institutions, laboratories and medical societies and other agencies interested in the subject.

Very truly yours,

(Signed) CHARLES E. HUGHES

* * * * *

One of the most difficult questions is the early diagnosis of consumption. A thing easier to talk about than to do. With his extended experience and great knowledge of this part of the work upon which we are engaged, I could introduce to you no better qualified speaker than Dr. John H. Pryor.

THE EARLY DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS

BY JOHN H. PRYOR, M.D.

Trustee of the New York State Hospital for Incipient Pulmonary Tuberculosis, Raybrook, N. Y.

The actual annual prevalence of tuberculosis in this State has not diminished but increased. Consumption continues to cause one-tenth of all deaths. True effective prevention is in its infancy. Little or nothing has been done in this State excepting in New York city. Ultimately the problem of tuberculosis will have to be solved by the health officers. We know that the disease can be detected early and that about 80 per cent. of those afflicted might recover if rational methods of relief were employed. The vast proportion of the upwards of 14,000 deaths from tuberculosis occurring annually in this State occur between the ages of twenty and forty, and this wanton waste of precious lives causes a loss of wealth to the State of about \$70,000,000 annually.

The eradication of tuberculosis is not a mere question of germs but involves a sociological reformation. The slogan of "sunlight and fresh air" must be changed to "food, sunlight and fresh air." Eighteen meals of oxygen a minute must be accompanied by three square meals of food a day. If the cost of existing, not living, continues to increase, consumption will be given greater opportunity to attack the underfed.

The early stage of the disease is seldom recognized, yet it means everything to the patient. At the State Hospital for Incipient Cases at Raybrook, nine-tenths of the patients recommended by physicians could not be admitted, because they were too advanced, and to-day there is room for fifty-five more patients out of a total accommodation of 200 beds. Many of these rejected have been under medical treatment for months for bronchitis, catarrh, obstinate cold or something else. The consumptive has long been the dupe of the quack and the patent medicine harpie, effectually aided by a modern enlightened press whose business manager is usually located nearer the earth than the editorial force. The importance of the finding of bacilli in the sputum has been exaggerated. It is rarely one of the early manifestations. Consider-

able stress should be laid upon the history, heredity and predisposition of the patient. Hemorrhage as an early symptom is somewhat rare in the Eastern States. A rise of temperature at some time during the twenty-four hours is most frequent reliable symptom. Loss of weight is usually slight and gradual. The importance of cough has been exaggerated. Physical examination of the chest is most important. The commonest location of beginning disease is at the apex and the initial form is apt to be found about one and one-half or two inches from the tip of the lung posteriorly. A positive diagnosis cannot be based upon the tuberculin test.

In treatment the prime requisites are rest for an indefinite time, pure open air and a full diet. A change of climate undoubtedly contributes much toward recovery, but experience has demonstrated that the incipient will recover in a large percentage of cases by proper care in his own State or country.

In this State there are numerous localities, some known and many untried, where excellent results can be obtained. Sanatoria designed for curable cases should be scattered through the State. The model sanitarium for the poor in the future will be the one which costs the least and accommodates the greatest number.

The unquestioned decrease in the death rate from tuberculosis during the last thirty years began before the discovery of the bacillus and the introduction of special direct methods of prevention. The decrease has been relative; that is, in proportion to the population. The actual annual morbidity from tuberculosis in this State has not diminished but increased. Recent tremendous progress in the nature of sanitary reforms has been almost entirely responsible for the reduction in prevalency and mortality. Consumption continues to cause one-tenth to one-eleventh of all deaths and the death rate rises and falls with the general death rate.

A successful crusade against consumption will be measured largely by a diminution in the proportion of deaths due to that cause and this result will depend largely upon two factors. Prevention and saving the lives of those who escaped protection. True effective prevention is in its infancy. Thus far it has been more or less of a delusion. Little or nothing has been done in this State, excepting in New York city. There great activity is displayed in a comprehensive campaign against the greatest scourge of humanity and the results may afford the best test of preventive measures to be found in the world.

Ultimately the problem of tuberculosis will have to be solved by the health officers. They have the power and should assume the responsibility. Only organization, effective plans and continuous, not spasmodic, activity, will win. Anti-tuberculosis societies may agitate and support, but the health officer must take the initiative and insure the enforcement of practical measures. Otherwise, so-called education of the public by those who are always positive, and sometimes accurate, may arouse public sentiment but not secure action. The association which compels the proper authority to perform his full duty is apt to accomplish the most lasting good.

We claim to know the direct and most of the contributing causes of tuberculosis and have declared that it is preventable and unnecessary. We know that the disease can be detected early and that about 80 per cent. of those afflicted might recover if rational methods of relief were employed. There are about 50,000 consumptives in this State and the death returns show an annual loss of life of more than fourteen thousand. The vast proportion of these deaths occur between the ages of twenty and forty when productive power and ability to provide for dependents is at its highest level. Science has not revealed a way of estimating the amount of physical suffering and distress caused by this malady and, therefore, we estimate the wanton waste of precious lives as a loss of wealth to the State of about \$70,000,000 annually.

If these facts are true, and we have told the public that they are true, why does the appalling carnival continue and the ghastly disgraceful death rate maintain its yearly record? The time to look for reasons seems to have arrived.

In the first place, we are learning that promises and predictions based upon narrow views have not been fulfilled. Consumption has not been eradicated, and there is nothing to show that it will be in the near future. The problem is stupendous and multiform and must be attacked by broad methods. It does not involve a mere bacteriological question, but a sociological reformation. The slogan of battle "Sunlight and fresh air" will be changed to "Food, sunlight and fresh air." Eighteen meals of oxygen a minute must be accompanied by three square meals of food. The poor cannot live on air and sunlight, and if the cost of existing, not living, continues to increase consumption will be given greater opportunity to attack the underfed. But we can save time by two confessions. First, the public is not properly protected.

Second, the death rate is not diminished as it might be in an enormous proportion by the early recognition of the consumptive and the adoption of well-known measures for relief. The responsibility for failure must fall largely on the physician and the hope of any true progress must depend more upon the education of the medical profession. The task is an unpleasant one but an impartial examination of existing conditions justifies the frank consideration of undeniable facts. The public has been inoculated with phthisiophobia, but there are signs of returning sanity. There has been a deluge of literature and an unrestrained flux of garrulity designed to reveal how much we know about tuberculosis. Now, how much has the knowledge been applied and how much has it helped the consumptive. The consumptive is an anomaly in the practice of medicine, and prolonged neglect has made his woe in a manner unique. He is the only sufferer from any known disease who does not receive the full benefit of medical skill and knowledge, and consequently consumption is the saddest thing in the world.

IMPORTANCE OF EARLY DIAGNOSIS

The diagnosis of incipient disease is the transcendent requisite. It means everything to the patient, and yet the early stage is seldom recognized. Until recent years an excuse existed for failure to detect the invasion of tuberculosis. Little or no provision had been made for the care of the curable cases and it may have seemed useless to promptly find the existence of disease, particularly among the poor. It was assumed that the patient was doomed, and he may have received the last new remedy or he was treated on the appropriately styled expectant plan.

EXPERIENCE AT RAYBROOK

About four years ago this State established a hospital at Raybrook to provide for 200 patients. The opponents of State care for this class prophesied that the demand for relief would be so great that the State would be financially endangered. They insisted that provision for only 200 was a mere flea bite and in that contention they were right. The largest population ever recorded at Raybrook has been 145. There is room to-day for fifty-five more patients. Furthermore, only about 60 per cent. of the inmates can be classified as incipient cases, and consequently an institution devoted to their exclusive care is less than half

filled by those who strictly belong there. Forty per cent. of those accepted on the report of examination made by State examiners are found to be moderately advanced or advanced on admission. Only one-tenth of the applicants for admission could be accepted because nine-tenths of those recommended by physicians were too advanced. The population of all the institutions in the State designed for the treatment of consumption shows that about 1 per cent. enter an institution at the time when the greatest number of apparent recoveries can be expected. After years of strenuous effort on the part of those interested in procuring promising cases for treatment it is found that the combined average for a large number of sanatoria in this country is about 20 per cent. of really favorable patients. The vital importance of early recognition and treatment is strikingly illustrated by the tabulated results obtained at Raybrook for four years. During that time 549 patients were admitted. Of this number 267 were in the incipient state, 145 moderately advanced and 47 advanced.

	Total cases.	Apparently recovered.	Arrested.	Im-proved.	Unim-proved.	Died, hemorrhage.
Incipient	267	219	37	5	5	1
		82%	13.9%	1.87%	1.87%	
Moderately advanced..	145	32	89	14	10	
		22.05%	61.38%	9.65%	5.9%	
Advanced	47	0	26	11	10	
			53.3%	23.4%	21.27%	

Thus of the incipient cases 82 per cent. apparently recovered and 13.9 per cent. were arrested. Of moderately advanced cases 22.6 per cent. cases apparently recovered and of advanced cases none apparently recovered. It is fair to assume that about 160 patients failed to recover because they were sent to the hospital too late. If there are 50,000 consumptives in this State and the average duration of the disease is about three years, there must be thousands of the afflicted at any given time who are in the early stages of the disease. I appreciate the chances for error in statistics due to personal equation and faulty technique, but imagine what an early diagnosis and vastly increased provision for proper care would mean in the Empire State. Remember, also, that every inmate is sent home with a liberal education. He knows how to take care of himself the best his condition and environment will allow, and he ceases to be a source of any danger to his fellow beings. Every graduate is a teacher of hy-

giene and the gospel of fresh air. The consumptive has a right to insist upon this chance. Why doesn't he demand it? Because he does not know, and generally is not told, that he is a consumptive, until too late.

WHY PULMONARY TUBERCULOSIS IS NOT RECOGNIZED

Why does such an insignificant number receive an opportunity to recover and why is the disease not recognized in time? There is nothing to be gained by quibbling or evading the answer. A large proportion of the medical profession do not, cannot or will not, detect the presence of pulmonary tuberculosis during the incipient stage. There can be no other explanation of certain deplorable conditions and the best remedy lies in the honest admission. It has been claimed that many poor patients do not consult a physician at the right time, and this is sometimes true, but the comparative number is small. With very few exceptions, the unfortunate patients who failed to gain admission at Raybrook had been under the observation of one or more physicians for months, and most of them had been treated for bronchitis, catarrh, an obstinate cold or something else. Furthermore, the experience of physicians at health resorts frequented by the well-to-do reveals a similar tendency to delay sending patients away until evidence of advanced disease is only too plain. An unknown percentage of unfortunates fall into the hands of physicians whose practice is more or less tainted by a growing commercial spirit. An overcrowded profession, the cost of living, a superabundant supply of medical colleges and variegated forms of healing account somewhat for the fact that the sufferer from a long-continued chronic disease is valuable prey. The consumptive has long been the dupe of the quack and the patent medicine harpie, effectually aided by a modern and enlightened press whose business manager is usually located nearer the earth than the editorial force.

REASONS WHY OVERLOOKED

In a search for reasons why beginning tuberculosis disease escapes the notice of the physician the most natural one seems to be that he has not been taught how to find it, and the fault is to be found in the medical school and the text-books. Many physicians have never seen to recognize, or examine an incipient consumptive. Their education was confined to the study of the advanced lesions and the later signs and symptoms.

EXAGGERATED IMPORTANCE OF THE BACILLUS

Probably the greatly exaggerated importance ascribed to the presence of the bacillus in the sputa and the dependence upon this as the only positive evidence has done more than anything else to distract attention from other reliable clinical signs of disease. As a matter of fact the appearance of the bacillus may usually be regarded as a late manifestation. There are instances when its presence may be one of the first indications of certain obscure forms of the disease, but as a rule with few exceptions definite physical signs are evident some time before it can be found. Usually bacilli are not ejected until considerable destruction of tissue has occurred and the lesion and its nature may be very apparent long before that time. Much needless inexcusable delay may thus be caused by waiting for its detection. Cases of closed tuberculosis will escape notice, and large affected areas may progress until an opinion is of little benefit to the patient. Quite frequently a satisfactory diagnosis can be made weeks or months before a search for the bacillus is successful. The belief that tuberculosis is present may be doubted by the laboratory savant, but the evidence is sufficient for the clinician. We often reach a conclusion with less evidence and without waiting for infallible tests. The undue significance given the bacillus has become one of the chief excuses for careless work, and a disinclination to acquire clinical aptitude and proficiency. The examination for bacillus is often imperfect and haphazard, and leads to a deceptive decision. If the whole amount of expectoration for twenty-four or forty-eight hours be collected and a sediment obtained by adding a solution of carbolic acid or liquor-potassæ and then the deposit be centrifugalized and spread on a number of slides the bacillus will be found more quickly in the end, and also more frequently. Practically all cases of pulmonary tuberculosis observed during life may progress to the state when bacilli are perceived, but the extent of the lesion and its effects may be checked by treatment in the meantime. With the admission that the bacillus should be looked for as a positive aid in diagnosis, and that its presence may be quite invaluable in confusing conditions to substantiate or confirm a difficult conclusion, let us dismiss that agent and consider other methods which we are compelled to employ. Most of them were well known to some of the older authorities, but they have assumed added significance as our knowledge of proper care has advanced.

Their study and application require more effort, time and patience than the dispatch of a specimen and the receipt of a report.

HISTORY, HEREDITY AND PREDISPOSITION

When tuberculosis is suspected a careful consideration of the family and individual history becomes more and more important, because the diagnosis and prognosis are becoming very closely allied. A case may be incipient and favorable or unfavorable. The importance once assigned to heredity has undergone a decided change. This is apparently somewhat due to the fact that we may call things by other names. The statement that the disease cannot be inherited or directly transmitted is not entirely true, because the bacilli have been found in the placenta and the fœtus of the tuberculous mother. Exactly how predisposition will account for the tendency of the young children of tuberculous parentage to die of tuberculous meningitis, and other forms of tuberculous disease, is not quite clear, and I fear the last word concerning heredity, predisposition and latency has not been said. Something is inherited which makes it worth while to scan the family history and remember that types and tendencies should not be overlooked. The recent attempt to discover evidence of immunity conferred by tuberculosis parents might be very interesting if it rested upon more substantial proof.

Valuable information can often be obtained by investigating the possible or probable opportunity for infection. Has the patient been exposed by occasional or close contact with a consumptive in the same house or shop? This is particularly important when the contact has been prolonged, or proper preventive measures neglected. Kaiserling and others have shown that the disease can often be found by examining members of the family thus exposed. Sometimes repeated examinations of the apparently healthful person, who lives with a consumptive, will reveal the evidences of disease before any symptoms appear or attract the notice of the individual. I offer an illustrative case. Miss S. lived in close contact with and cared for a sister suffering from advanced consumption. To the best of my knowledge proper means for prevention were observed. Miss S. called upon me several times at intervals of two weeks, requesting an examination of the chest as a safeguard. In the course of time I discovered signs of an invasion of the left apex. She was apparently in robust health and betrayed no symptoms whatever. Two

and one-half weeks after the discovery of the disease a slight cough and an evening rise of temperature developed. There was a very slight loss of flesh and no expectoration. She was sent away and seven weeks later the expectoration contained bacilli. She apparently recovered and remains in good health after the expiration of two years. These cases offer the best opportunity for the study of slight lesions during the stage of invasion.

An effort should be made to learn if the patient's history reveals evidence of a preceding attack. The lesion under observation may be secondary and due to an auto or reinfection. Antecedent attacks and the signs of an old lesion are much more common than is generally supposed. The patient may recall a period of ill-health characterized by fever, loss of flesh, etc., ascribed to a cold or the grippe, or possibly the symptoms of a localized pleurisy may have been present. An examination may disclose both the old and the new focus of disease. There may be signs of a healed or quiescent lesion in one apex and active disease in the other. Again, and this happens rather frequently, a quiescent or temporarily closed area of tuberculous lung may after an indefinite time display acute exacerbation and be mistaken for a primary infection.

The opinion that all pleurisies are tuberculous in origin is already in process of revision, but the history of attacks not accompanied by pneumonia may be included with suspicious testimony. The presence of bacilli in the pleuritic effusion can sometimes be determined by inoscopy when other procedures fail. Even if we assume that a large percentage of cases of pleurisy with effusion are tuberculous in origin, it does not follow that tuberculosis of the lung will accompany it or even supervene.

The following definition of incipency has been adopted by the National Association for the Study and Prevention of Tuberculosis:

"Slight initial lesion in the form of infiltration limited to the apex or a small part of one lobe.

"No tuberculous complications. Slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight).

"Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours, especially after rest.

"Expectoration usually small in amount or absent.

"Tubercle bacilli may be present or absent."

Obviously any brief definition will be subject to criticism and cannot for many reasons be employed arbitrarily. Tuberculosis of both apices may be slightly manifest and the condition favorable, but as a rule it is followed and not accompanied by involvement of the other. The inclination to regard incipency simply in relation to time is quite general. The duration of the disease is quite conjectural, and with few exceptions it has been present much longer than is assumed. A morbid process may also be recent and yet extensive, progressive or very grave. A slight lesion may produce profound systemic disturbance or the individual resistance be unusually marked.

In considering symptoms it must be remembered that we are dealing with an insidious disease. From the time of infection months may elapse before objective or subjective symptoms are pronounced. Those deserving special study are in the order of their importance hemorrhage, fever, loss of weight, chlorosis or anæmia, loss of appetite and cough with or without expectoration. All these symptoms are rarely associated in the early stage.

HEMORRHAGE

Hemorrhage occurring during the incipient stage or as an initial manifestation seems to be somewhat rare in the Eastern States. In my experience it is recorded in about 5 per cent. of this class. At the New York State Hospital an examination of the histories of 285 cases of incipient tuberculosis shows that hemorrhage occurred in 19 per cent. When other causes have been excluded its significance cannot be too strongly emphasized, and the history of a hemorrhage antedating by months or years more recent suspicious symptoms should invite a search for a previous lesion.

FEVER

A rise of temperature at some time during the twenty-four hours is probably the most frequent symptom upon which we may place much reliance. This symptom is more frequently overlooked than any other. There is absolutely nothing to be gained by asking the consumptive if he has fever. The advanced case will visit the physician's office daily, if the physician is foolish enough to allow it, and insist that he has no fever when the thermometer will record a temperature characteristic of typhoid fever. A temperature of 103 or 104 is frequently seen. Not more than 2

per cent. of the early cases will have any sensation of fever. The highest elevation of temperature usually occurs between the hours of 4 and 7:30 p. m. The morning temperature as a rule is normal or subnormal even in febrile cases. Consequently little or no dependence can be placed upon any observation at that time. If a case is to be closely studied, the temperature should be taken every two hours from morning until evening and the rectal temperature is more reliable. There are instances when the presence of fever is entirely overlooked unless this rule is followed. Thus a marked daily rise of temperature may occur only at noon and be absent in the afternoon or evening. It is a wise precaution to examine a suspected patient in the evening. Exposure to cold air, particularly if prolonged, has an influence upon the febrile curve. Allow the patient to wait until he is warm on a cold day. Otherwise the thermometer may require from four to ten minutes to register the actual temperature. Many of the new cheap thermometers require an insertion of several minutes instead of one to register properly. Whether the temperature is taken after exercise or rest will be more noticeable in a consumptive than other patients. Fever is usually more marked in children than in adults suffering from tuberculosis, and it is often temporarily increased during menstruation and an attack of indigestion. A diurnal rise of temperature due to syphilis, intestinal toxæmia, or neuræsthenia is apt to be most puzzling and sometimes difficult to exclude. To assume that an active lesion is always associated with fever may be misleading at times, but it is often an excellent guide.

Loss of weight is usually slight and gradual, not rapid and great. The standard of weight for the individual should not be fixed at the highest ever attained. Age, habits, and the mode of living should receive attention, and the statements of patients concerning their normal weight is often most unreliable. In view of the chances for error it seems safe to compare the present with the average weight while in health. There is usually a difference of two or more pounds between the morning and evening weight. The loss of appetite and indigestion are of decidedly relative value because they are so common in other conditions. Chlorosis and anæmia are much overestimated as early symptoms. They are frequently due to other causes and more frequently follow extensive disease than precede the state of invasion. The fact that chlorosis and neuræsthenia have an influence upon the prognosis

is another matter. A decided leucocytosis, however, may be of signal assistance at times in eliminating tuberculosis and directing attention to other forms of infection.

COUGH

Practically all text-books lay stress upon the cough as an early and most constant symptom. Very often it is due to pharyngeal irritation and subsides after local treatment. Many times the so-called hacking cough owes its origin to nervous habit and disappears by an effort of will or as a result of suggestion. It is not nearly so common among men as it is among women. As an early sign of tuberculosis its importance and the frequency of its presence have been much exaggerated, but it performs valuable service by directing attention to the chest. Physicians who visit a sanitarium for the care of incipient consumptives are always surprised by the absence of coughing.

All the symptoms which lead to a suspicion of pulmonary tuberculosis should be considered so far as possible in a group, and their chief importance will be found in encouraging thorough and repeated examinations of the chest. We have learned that symptoms formerly ascribed to a pre-tubercular state are usually caused by post-tubercular conditions. It must be borne in mind that early manifestations, with the exception of hemorrhage, are due to toxæmia, and individual resistance will influence the time of their appearance and their character. The earlier the diagnosis the less pronounced will be the symptoms as a rule.

PHYSICAL SIGNS

In discussing the physical signs commonly associated with incipient disease a few words may well be devoted to the reasons why they are sometimes undetected. Not enough time is spent by the student or physician in the study of normal sounds. The cardinal rule "Compare — always compare" is not always observed. The normal relative difference between the right and left upper lobes are not appreciated. The chest is not thoroughly bared, particularly in women, and the search is not thorough. The ear may not be trained or the hearing acute, and the unmusical ear may be incapable of detecting slight changes or alterations in pitch. The technique of percussion is not an easy art to learn, and is only acquired by practice. The finger is not properly

applied to the chest wall, or the improper stroke elicits only the bony resonance of the physician's finger. The selection of a stethoscope, the fit of the earpieces and the unnecessary length of rubber tubing should be considered. Opportunity for frequent practice gives one an enormous advantage, but even the skilled examiner realizes that absolute concentration of attention and plenty of time are required for careful search. While the immediate application of the ear may be preferred, the spaces above the clavicles cannot be effectively examined by that method.

Experience has shown that any type of chest may be invaded by the bacillus. When invasion is localized and the focus slight in extent the chest will, as a rule, reveal no significant change in conformation. Depressions in the chest wall and relative lack of movement in certain localities are much more noticeable when the disease has advanced to a more marked degree.

By aptitude and much practice the sense of feeling may become very acute and some observers rely very much upon evidence obtained by palpitation. The signs elicited by palpitation are necessarily of a collateral value. The excursion or modified function of a small portion of the lung can be studied more accurately by other methods, and the transmission of fremitus as revealed by sense of touch at the apex may be very deceptive. Many teachers and text-books apparently assume that the chest is to be examined while the patient breathes in the natural or accustomed manner. After an individual has relinquished active exercise the full deep breath may be a rare event or an exertion. This is particularly true of women. Furthermore, deep expiration very frequently must be taught. Probably one of the principal reasons why the early signs of pulmonary tuberculosis escape attention is the fact that full exercise of the lungs is not enforced to gain information not revealed otherwise. It is quite frequently impossible to find distinctive signs without obliging the patient to breathe in and out forcibly. The movement of the tip of the lung, the extent of impairment or consolidation, the character of the expiratory murmur and the presence and nature of rales can very often only be determined by this method. A proper examination should include observation during natural and forced respiration. The commonest location of beginning disease is at the apex and the initial focus is apt to be found about one and one-half or two inches from the tip of the lung posteriorly. An analysis of the histories of 285 incipient cases admit-

ted to the New York State hospital shows that the lesion was located as follows:

Right upper lobe.....	171	60.5%
Right lower lobe	14	4.9%
Left upper lobe.....	98	34.3%
Left lower lobe	2	.7%

When tuberculosis of the lung accompanies or follows pneumonia or pleurisy it is more apt to develop in the middle or lower lobes, but our attention to-day is confined to the insidious incipient variety. Percussion and auscultation should include the apex of the lung which extends during inspiration one to two and one-half inches above the clavicle. The note on percussion will show relative dullness compared with the other apex or another portion of the lung. Strong and light percussion may both be necessary to bring out the sound and the note can be analyzed or defined as shorter in duration, higher pitched and quality modified. Sometimes if the change of pitch cannot be appreciated it is of assistance in comparing to hum and endeavor to imitate the gradation of change. At times a sense of resistance to the finger can be felt. Delimit by percussion the movement of the tip of the apex in the region of the neck and mark with a pencil the height to which it rises upon full inspiration. The diseased lung may be restricted by infiltration, consolidation or adhesions and the extent of its movement modified proportionately. Of course, one must remember that the right apex is normally relatively dull and higher pitched than the left. A lesion at the right apex is for this reason more difficult to recognize but the danger of error has been decidedly overestimated by some authorities on physical diagnosis. The note on percussion can be compared with adjacent areas and by repeated examinations the extension of the dull area can be watched. Again the play of the apex can be quite accurately determined by Kornigs' method.

The change in the respiratory murmur most frequently revealed by auscultation may be characterized as modifications of broncho-vesicular breathing. They are distinguished by slight increase of tubular character, and the expiratory sound which is the essential element to study is relatively higher pitched and prolonged. Decided confirmatory evidence will be found if fine rales can be detected. They must be distinguished from the coarse distinctly moist rales in the larger tubes. The older English clinicians distinguished between them by the terms clicks and rales

and the words are as truly descriptive to-day. The clicks crepitation or fine rale is often unobserved for several reasons. They may be very few in number, fugitive or occur in showers. They may often be heard in the morning before expectoration has cleared the locality of secretion which accumulated during the night. The essential test is to oblige the patient to cough and breathe deeply. Many times they only appear after several efforts in coughing have pulled apart the mucous coated agglutinated structures. Physicians occasionally disagree because one will hear rales and the other will not. The time of day, the temporary condition of the lesion and the method employed may account for the difference in observation. In some instances the only sounds discovered by auscultation are diminished breath sounds. In such cases signs of activity may be heard over adjacent territory and particularly near the clavicle. If only suppressed breathing is heard other signs must be considered to obtain evidence of a deposit, which is almost sure to be tuberculous at the apex if there is no evidence of other thoracic disease. Cog-wheel respiration may lead to suspicion but it is not of distinct diagnostic value. It can be heard in many nervous patients and may be found on one examination and absent at another. A distinct friction sound which can surely be designated as such is rarely heard except when the lesion is old, and it is much more indicative of a secondary pleurisy when its appearance is temporary.

Finally the transmitted whisper is of decided value in confirming the presence of morbid changes over a small area. Many times the increased audibility and high pitch of the sound will denote infiltration or solidification and remove doubt caused by indefiniteness of other signs. The transmitted whisper affords a much more delicate and reliable test than the speaking voice, particularly if the latter is high pitched, weak and not penetrating. I have deliberately avoided mentioning roughened breathing during inspiration as a reliable sign. If the word harsh as employed by the Germans has been confused, that is another matter, because harsh breathing may be simply a modification of bronchovesicular breathing which becomes more marked later. The differentiation between a recent slight lesion caused by tuberculosis or syphilis or one following influenza is seldom called for, but it can usually be accomplished if the history and all the clinical evidence is closely scrutinized.

TUBERCULIN TEST

The tuberculin test as a positive indication of tuberculosis offers opportunity for difference in opinion and discussion. The tuberculin is injected into the patient, not into the physician. This may explain somewhat its frequent employment when quite unnecessary. The unprejudiced observer who has watched the pendulum swing can still afford to be conservatively skeptical concerning some positive tests. The character of the product, the dose and the technique certainly require more consideration than has generally been given them. My personal experience has been very slight because instances when its use might seem necessary or justifiable have been extremely rare. Opportunity to observe its employment by others when it seemed unwarranted and savored of needless interference have been more common. After the other evidence of pulmonary tuberculosis has been carefully collected and sifted, if doubt still exists, continued watchfulness will practically always remove uncertainty in a short time without great detriment to the patient. The most proficient examiners use the test the least or not at all. A reaction may not furnish the knowledge which the clinician desires. If we are willing to assume that the reaction is infallible we must still decide if possible where the implanation exists and what is its character. Allow me to cite two characteristic instances to exhibit the possibility of error if a diagnosis is based upon this test. An opinion was ventured that one man was suffering from aneurism of the arch of the aorta and another of sarcoma of the mediastinum. Other physicians disagreed and ascribed the manifestations to tuberculosis of the lung. Both patients were given tuberculin and decided reactions followed. A positive diagnosis of tuberculosis of the lung was then made. Both of the patients died within a few months, and an autopsy revealed no evidence in either case of any disease in the lungs. The original diagnosis was confirmed. Whether tuberculosis existed elsewhere in these patients I do not know. The uncompromising advocate of the tuberculin test always has the advantage because no tangible evidence is required. Within the last few months a physician of my acquaintance has been applying the modified test to the conjunctivæ of his friends in accordance with Calmette's method. Three of them, who have passed middle life and are apparently in perfect health with no history of tuberculosis, responded to all requirements. But the contribu-

tion made by Franz is most interesting and suggestive. He tested with tuberculin the members of two Austrian regiments. They were supposed to be in good health. Sixty-one per cent. of those in the first year of service reacted to doses of 1 to 3 Mg, and 68 per cent. in the second year of service reacted to similar doses, but, not content with these results, Franz asserts the belief that the injection of 10 Mg would have shown 100 per cent. of reactions. The purpose of this investigation by Franz was to learn the number free from tuberculosis. Evidently the clinician will have to be content with the recognition of tuberculosis when he can perceive evidence of its location, extent and character. When the tuberculin test seems to be demanded, what conditions which may give a similar reaction shall we exclude? Will the influence of suggestion and the presence of syphilis or chlorosis complete the list or are there other causes still unknown which may mislead?

TREATMENT

When the consideration of treatment is limited to the incipient case there is slight room for any controversy. The earliest possible diagnosis should be followed by the immediate employment of the only method or procedure which promises anything. The prime requisites are rest for an indefinite time, pure open air and a full diet. The patient should be under the care and control of a competent physician, and discipline is an essential attribute of the plan. There are many details in management which influence the result, but time will not allow of their discussion. One very essential part of the treatment is often disregarded. I refer to the mental condition of the patient. The patient who can gain admission to a properly conducted sanitarium has a decidedly better chance for recovery than another who is not under close observation. A rigid routine and close supervision of the character and quantity of food are large factors in the result. Most patients reach recovery by the aid of the alimentary tract. A change of climate undoubtedly contributes much toward recovery, especially if it is more favorable for treatment or allows more comfort. The advocate of home treatment does not usually spend his vacation in his back yard. Certain localities have gained a reputation for supplying conditions exceptionally favorable. Purity of the air and freedom from dust are two of the essentials. The climate of Colorado and some

regions of New Mexico and Arizona offer advantages not to be found in the East. Dryness and equability and a much larger amount of sunshine constitute the chief attributes of superiority. The ability to seek a favorable climate and environment is limited to the few, but fortunately experience has demonstrated that the incipient will recover in a large percentage of cases by proper care in his own State or county. In this State there are numerous localities, some known and many untried, where excellent results can be obtained.

MORE EXTENSIVE PROVISION FOR THE POOR

The immediate imperative demand is for more extensive care of the poor consumptive. There is little encouragement now to provide greater opportunity for common-sense treatment if the disease is not recognized until too late to secure easily obtainable results. If the demand for enlightened care and greater accommodation for the earlier cases were made by the physician and the sufferer, comprehensive plans for relief could be devised and executed. This State has inaugurated the movement and the experiment has proved to be a complete success. Sanatoria designed for curable cases should be scattered through the State, and we should count the inmates by thousands instead of hundreds. The buildings and equipment can be and should be made inexpensive. The model sanitarium for the poor in the future will be the one which costs the least and accommodates the greatest number. The money will be spent for food and not for luxurious buildings and rooms. Every dollar wasted helps to deprive some unfortunate of a chance for his life.

A physician qualified to conduct a sanitarium according to modern methods can obtain better results if you give him a barn with enough openings and a kitchen than some of the county and city hospitals, where the old routine is followed. Young men trained in the diagnosis of tuberculosis and the method of sanitarium care are greatly needed in this country. The development of State care alone will necessitate this new class equipped with expert knowledge. Good results are obtained in apparently unfavorable climates if simple rules of management and the introduction of essential requirements are combined. The place to study methods of control and treatment is at a hospital for incipient consumptives, not a home or boarding-house falsely called a hospital, where advanced cases wait for death. There

are great advantages to be derived by sending the poor consumptive of the curable class some distance from home to an institution favorably located with relation to helpful influences. Visiting and distraction is obviated, more strict control is possible and the patient realizes that he must devote months to one object.

I have on several occasions presented arguments to show that the care of the early case should be intrinsically a State problem, and time and experience strengthen the hope and conviction that the State will ultimately be gradually forced to assume the charge. I know of no work which should appeal so strongly to your association as the promotion and encouragement of this reform. Our battle for improved care of the consumptive is not won because we lack harmony in ideas and unity of purpose. One urges home treatment, another would devote all care to advanced cases; many would confine all action to prevention, and some in the rear ranks want to try one more alleged remedy, or are waiting for the discovery of a specific curative agent. At present the revival of tuberculin treatment, in the form of small doses administered through a long period, seems to be gathering force for a wild sweep over the land. At times the history of medicine seems to have been written in vain, and all the grim wrecks strewn along the crooked path of progress are totally disregarded. The widespread, general and indiscriminate use of tuberculin will cause infinite harm. The fact that the dose advised is so small that no direct ill-effects will follow is not the question involved. A danger lies in reliance upon a form of treatment which if used alone will prove disappointing. Patients unwisely selected for this treatment are being kept at home while months are consumed in the trial of a new method, and the fact is unheeded that those who have had sufficient experience to form any judgment of its value have employed the remedy in carefully selected cases, who also enjoy the beneficent hygienic conditions which are known to be the most successful. The results, when any are claimed, are rather indefinite and to a certain extent assumed. Tuberculosis is pre-eminently a disease of exacerbations and lulls, and this fact, coupled with the mental effect produced by any new treatment, accounts largely for remarkable effects observed by enthusiasts. It would be difficult to devise a method of treatment more financially remunerative to the unscrupulous and selfish physician. An excuse can be offered for keeping the patient at home indefinitely, and

the necessity for making a prompt diagnosis and sending the patient elsewhere is avoided.

CONCLUSION

The great white scourge must be attacked by manifold measures, and the problem is colossal. Science must be blended with pity, charity and remorse. The results of stupidity, apathy and neglect must be met and remedied. The dangerous consumptive is the neglected consumptive. The unafflicted must be protected from the living dangerous victim who typifies the accusing appalling proof of inaction, and the hopeless wreck should have his tottering weary journey to the grave made as easy and gentle as the "ebbing flow of life" will permit. The hope of redemption and the result of the chief struggle in the conflict will depend principally upon one fixed resolve.

"Find the consumptive at the right time and help him in the right way until he is well. If you ignore or neglect him too long pay the full penalty by protecting the public and helping the poor victim until he is dead."

At one time most of the consumptives died because they were poor. Now most of them die because of ignorance and apathy. The medical profession needs education as much as the public. "Vollies of eternal babble" will not conquer consumption. There has been plenty of talk; what we want now is action aroused by a saving sense of duty and governed by common sense.

COMMISSIONER PORTER — The next paper on the program is by a gentleman who is president of one of the sections of the International Congress — the section which deals with the hygienic, economic and social aspects of tuberculosis. There is no man perhaps whose work along organized charity is better known than that of the next speaker. And no one's advice in such matters is more anxiously sought for than that of Dr. Edward Devine.

THE DUTY OF THE STATE IN THE PREVENTION OF TUBERCULOSIS

BY EDWARD DEVINE, M.D.

Secretary of the Charity Organization Society of New York City

You have instructed me, Mr. Commissioner, to lay down the law with regard to the duty of the State in the control and prevention of tuberculosis. It appears to me better not to discuss the matter in the abstract, but rather with immediate reference to our own situation in the State of New York; and from this point of view, having Raybrook and other existing institutions in mind, appreciating the limitations of existing statutes and the powers of our health authorities, it may be said that the whole duty of the State, acting through central and local authorities, is to be summed up in two words, control of advanced cases, and popular education in the means of prevention.

I assume that in the treatment of tuberculosis, as of other diseases, there is a large place for the private physician and for the ordinary relation, both professional and pecuniary, between doctor and patient. I assume also, that there is an honorable place for the hospital and sanatorium in which patients pay in full for their maintenance and medical care. The State has not yet undertaken responsibilities to the exclusion of these elementary principles; all our theories of State action imply that the private practice of medicine is to continue, and that free hospital and sanatorium care are for the poor. Possibly different theories may be in the air; possibly the State may eventually put the care of the public health where it has already put provision for public education; but we have no warrant as yet for formulating such a policy, and far short of it there is still abundant opportunity for all the useful State activity which we may reasonably expect.

By far the greatest part of the treatment of early cases will fall within this domain of private practice and private sanatorium care. The reason is obvious. If the disease is discovered at all in the early stages the patient is still as a rule financially independent, and self-reliant in choosing his own course. He is unwilling, naturally, to stop work for a protracted period, or if, on stern

medical advice, he adopts this course, he can still determine for himself, under advice, where and how he shall live, and he has some resources in savings, relatives, employers, friends; or some slight earning capacity; or, failing these, there are a number of semi-charitable institutions like Stony Wold, Loomis and others from which, in the early stages, free or inexpensive care may be obtained. There are exceptions — a few who cannot care for themselves and for whom there is no private provision, and for these such institutions as Raybrook and Otisville may properly provide. If, however, we may judge by the vacancies in these institutions, and by the number of really suitable applications which they receive, there is at present no need of further provision of this kind, even in the city of New York, where the need is doubtless greatest. The situation appears to be that the supply of beds for strictly early cases is equal, or very nearly equal, to the demand; and, through the carrying out of plans already made, will remain so, unless the standard of care in these institutions should be considerably raised, their attractiveness as places of abode considerably increased, and of this there is no apparent probability, and, it may be added, no very great need.

So far as intermediate and advanced cases are concerned the situation is far otherwise. Even for those who are now willing to go into the hospital, there is not room enough. There are thousands more who, given an ideal system of widely distributed local hospitals near of access to the homes of the poor, could readily be persuaded to come into the hospitals for the better care which they ought to have, and for the incidental protection of others which such removal would insure. There are hundreds of others throughout the State, who might not voluntarily accept hospital care even after enlightening education and persuasive argument, but who are so dangerous to their neighbors that they should be removed as in other cases of contagious disease. For all of these three classes, therefore, increased hospital or sanatorium facilities are required:

1. Those who are anxiously seeking institutional care, but for whom it does not exist;
2. Those who might reasonably be expected by proper educational means to be brought to the same state of mind, and
3. Those who, as a last resort, should be removed from their homes as centers of infection.

Even of this something is done on a commercial basis, and something is done by private philanthropy; but it is obvious that

neither method will do anything like so much for the advanced as for the early cases; private enterprise because such patients, in the vast majority of instances, have exhausted their resources and cannot pay for their care; and private charity because there is for them a less hopeful outlook, and, as the resources of philanthropy are not unlimited, it is natural that they should be devoted first to the care of those who, in a comparatively limited period, can be restored to health and to wage-earning capacity. A few foundations, mainly on a religious basis, are likely to be maintained from pity and in order that the dying may receive the consolations of their religion; but even in these institutions there is a tendency, while maintaining a religious atmosphere and control, to ask the State for financial support, so that we may look forward to a time, if it has not already come, when through the absence of business enterprise in this field and the inadequacy of private charity, practically the entire burden of maintenance for advanced cases, save for the wealthy, will fall upon the broad shoulders of the State. This is by no means altogether to be deplored, for with support naturally goes control. The more complete the responsibility for the maintenance of a particular class the more complete will be the opportunity for the working out and carrying into effect of a rational policy which shall be comprehensive, adequate and effective.

When it comes to a statement of a policy for the State to pursue, in dealing with that large part of the problem which remains after eliminating private enterprise and private charity, there still remains one serious complication, viz., that it falls partly within the province of public health, and partly within that of public charity. In other words, we have to do here with the care of the poor and with the protection of the public health. If these two departments of administration were combined in the hands of the same persons the task would be simpler, at least simpler theoretically, though perhaps not in practice, since after all there are two things to be done, and if the same authorities were intrusted with both it is very likely that one or both would be neglected.

Taking things again as they are what needs to be done by the health authorities is to protect the public health, and what needs to be done by those who are charged with the care of the poor is to provide sufficient and decent accommodation for such as need public care. In other words, this first duty of the State is to

provide either through a modification of local almshouses and public hospitals in the cities and towns, or by a system of State hospitals numerous enough and widely distributed throughout the State, for those advanced cases which both humanity and public policy would remove from their homes.

There seems to me no sufficient reason for transferring this responsibility from those who are already by law charged with the care of the poor. The commissioner of charities, the overseers of the poor under the guidance of the county superintendents of the poor, and the State Board of Charities, would appear to be the proper authorities to undertake it. Already in many cities and towns they are acting in an enlightened way, and the whole duty of the health authorities, with reference to the matter, would appear to be to awaken the overseers and commissioners to their duty to help them to secure the necessary appropriations, to render in suitable ways professional counsel and direction, and to co-operate with them in securing public approval for a vigorous policy and acquiescence on the part of patients in the better treatment which these special hospitals afford.

It follows that the disposition, which has been shown in sporadic instances, for health authorities to ask for funds to establish such institutions under their own auspices is a mistake, tending to confuse public functions, and resulting in a less efficient discharge of the respective duties of the two great co-ordinate branches of administration, relief of the poor, and protection of the public health.

In distinguishing thus sharply between hospitals and sanatoria for advanced cases in which we are still sadly deficient, and sanatoria for early cases of which we appear to have a sufficient supply, I would by no means wish to imply that the hospital for advanced cases should be so planned or managed that the faces of its inmates are turned irretrievably and continuously toward the grave. Assuming competent management and a due sense of responsibility it would perhaps not be too much to say, as I believe it has been said, that there might advantageously be some early and intermediate cases in all such hospitals. At any rate, until prediction in individual cases is far more certain than at present and until the personal element in recovery from disease is a more calculable factor, it should, of course, be assumed that every case is a hopeful case, hopeful at least of arrest and improvement under favorable conditions, hopeful that

the inextinguishable hope of the patient itself may have more foundation than other, and after all it may be irrelevant, cases would indicate. The spirit of research, of scientific advance and of personal sympathy are as much in place in the hospital for advanced cases of tuberculosis as anywhere.

Neither would I wish to be understood that the conventional hospital of the present type is the only resource for dealing with these more advanced cases. The day camp in which the patient sleeps at home, but spends many hours of every day under good conditions and wise direction, may have undeveloped possibilities. The special dispensary, as an adjunct both to the hospital and to the day camp, has certainly a very important role to play at least in the transitional stages of the next few years. Both of these, however, and indeed to a great degree the sanatorium itself, are to be looked upon rather as parts of a system of education in the control and prevention of a disease than as a thoroughly satisfactory means of treating individual patients. The conclusion of the whole matter is, with reference to this branch of my subject, that we should seek liberal appropriation for advanced cases, that we should in all suitable ways, by giving such institutions appropriate names, by their location, by the standard of physical comfort maintained in them, by the medical and nursing service, and by suitable educational propaganda, encourage their use; that they should be branches of our general system for the care of the poor, but that the health authorities, by additional legislation, if necessary, should have the power in extreme cases to direct the removal of patients to them, and to determine the length of their stay; while to the health authorities also will fall the natural leadership in convincing the various communities of the need for them and in determining their general character. In default of time to discuss the details of the construction and management of such institutions I may refer to the hospital already established on the Poor Farm of Erie county, at Rochester, and on North Brothers Island, N. Y., as close approximations to the kind of institution of which in New York State at the present time we should have at least one in every county, and in the more populous counties a varying number, probably not less than one to each 250,000 of the population.

In discussing the first part of my subject, the care and control of advanced cases, I have already to some extent anticipated the second — public education in the prevention of disease — and

yet the field of public education extends illimitable distances beyond the incidental opportunities which present themselves in connection with provision for advanced cases. If the State is really to concern itself with the protection of public health, as the establishment of State and local boards of health seems to imply, and if it is to intrust to this branch of the public administration any duty beyond that of the abatement of recognized nuisances, then it is evident that the first elementary, fundamental, absolutely essential condition of such a policy in this State and in all our States has still to be met.

And now I have need to summon my courage if I would really deliver my message and rightly interpret my mandate. For what the State has not yet done, but must do, if through the health authorities there is to be carried on an effective educational propaganda, is to educate its health officers. If this were an original idea of my own, and if no one connected with the administration of a health department had recognized the need of which I speak, I would still, I think, venture to tell the truth about it, but it would be with somewhat more apprehension than I now have as to how the proposition would be received in this conference. But as the most competent and eminent health official of whom I have any knowledge has not hesitated to suggest, at least in private conversation, that the most important element to-day in the whole movement for the prevention of tuberculosis is not the sanatorium, the day camp, the dispensary, the visiting nurse, the illustrated lecture, the instructive leaflet or the relief fund, but simply and solely the creation of a new type of public health officer, I have the greater assurance in blazoning that idea abroad, here where it will be most appreciated; possibly with the reckless irresponsibility of a layman, but also with the profound conviction of a citizen who conceives that the community has a right to expect greater results from the large expenditure of public funds for health purposes than have yet been realized.

There is little need in this presence to dwell upon the lamentable conditions under which health officials now obtain their positions and the miserable terms upon which they hold them. The spoils system survives here in the place from which in common decency it should first of all disappear. Fear of offending this and that citizen paralyzes the arm which might have been strong for the protection of the common welfare. Prejudice and superstition surround the health officer; and even his brethren in the

medical profession, from jealousy and selfishness and partisanship, fail to come to his support. His position is too often without dignity, authority, influence or respect. All these the health officer might conceivably gain if he had been trained for his work, if he had within himself the confidence which comes of knowledge and skill, if there were professional standards to which he might appeal; but these also are lacking. To be a health officer in this State of itself means practically nothing. This is a pretty sweeping statement I have read but as I go along I will allow it to stand as it is. It means practically nothing. The few exceptional instances where a strong personality or favorable conditions have made it otherwise are not due to any general policy. Even the men who have made themselves as health officers indispensable are not compensated properly for their public services, but are as a rule maintaining themselves by their private practice and contributing from a sense of public duty that service which the State should in every community be in a position to demand as a matter of right.

It goes without saying that political consideration should be absolutely excluded from the administration of a department of public health. Until this is done we may expect to see everywhere such exhibitions of ignorance, incompetence and cowardice as I have myself had occasion to observe before now, not only in a city of 4,000,000 but even in a higher degree in a suburban city of less than 20,000.

The elimination of politics is only a beginning. No one should be appointed a health officer who has not prepared himself specifically to deal with questions of public sanitation. The water supply, the milk supply, food markets, the disposal of garbage, the drainage system, the cleaning of streets, overcrowding, the disposal of the dead, disinfection after contagion and numberless other problems many of which have only slight connection with the ordinary practice of medicine, are of vital importance to the public health officer — not that it may be of vital importance to him in securing and holding his position — but of vital importance to the community which he nominally serves.

As Dr. Biggs suggested in his address as President of the National Association in Washington last year, two steps are necessary to bring about these desirable results. First, the provision of the necessary instruction, and second, an amendment to the Health Law restricting appointments to those who have quali-

fied themselves by taking advantage of it. You will notice the way I have suggested these things. At present there is no place in which one may obtain a thorough course in preventive medicine, public hygiene, sanitary science or whatever other term we use to designate the instruction which a public health officer requires. The Leland Stanford University, Massachusetts Institute of Technology and Institute of Hygiene, Philadelphia, have courses of instruction in these subjects, but for the benefit of the health officers of the State of New York none of these offer a professional course of instruction of the kind considered desirable to aid them in their work. In the absence of private endowment the giving of such instruction is certainly the duty of the State. It is implied so clearly that there can be no difference of opinion about it in the very existence of health boards exercising the functions which have everywhere been vested in them. The Israelites who were trying to make bricks without straw were engaged in child's play as compared with the American community which seeks to protect the public health through inspection, education and compulsion, and finds at its disposal for the purpose health officers unpaid or underpaid, selected by political or personal favor, dependent for their income on their popularity as physicians, and without a scintilla of special training for the difficult profession to which they are called. The result is that the public health is not protected, preventable diseases flourish uncontrolled, and illegitimate and unholy profits are made in ways in which no honest man can soil his fingers and from which dishonest men should be sternly kept by the servants of the people. The general public is slow, as in all things, to appreciate the value of expert service, but expert service is here indispensable and expert service implies both professional training and permanent tenure in office. Most of all it implies a certain mental attitude, an interest in a certain class of problems, a point of view entirely different from that of the medical school, or of the school of biology, or of chemistry, or of agriculture, let us say — not incompatible with theirs, even in a broad sense, including theirs but still distinct — a point of view which comes more naturally, perhaps, to a physician than to any others, but is by no means universal in the medical profession; the point of view of a jealous guardian of the public health; of a social reformer who can see the point of a housing reform movement, a pure-food movement, a child-labor movement, an eight-hour movement, a small-parks

and playground movement, a movement for the prevention of tuberculosis. We need a school of hygiene, if for no other reason, to create a group of public officials and private citizens who will be ready on all occasions to promote all movements not only for the protection of the public health — that is merely negative though essential; but for the promotion of the public health, for the attainment of that end about which we may assume that we are all agreed, namely, the lowering of the death rate.

Since the State thus has need of trained service and since the professional school which alone can supply it does not exist, it is the first duty of the State to supply such a school, laying broad its basis in all the necessary sciences, including that of government, but adding that special knowledge of the particular subjects in the field of preventive hygiene which will prepare the health officer for the efficient discharge of his duties. With such schools in existence there will be no hardship in requiring that the degree which they grant shall be obtained before one is eligible for appointment as sanitary inspector, as milk, food or tenement-house inspector or in any other position having directly to do with the safeguarding of the public health. As in other transitional periods it would not be unreasonable to make an exception in favor of those who are now discharging acceptably the duties of their positions, but permanency of tenure, a more nearly adequate compensation and an advancing standard may be required of them also; and of their successors such special training as I have indicated in addition, as a preliminary.

A precedent is, of course, afforded by the existing practice in Great Britain, where no one is eligible as health officer until he has obtained the degree of M.O.H. from one of the universities or special schools in which this degree is given. Possibly if a similar requirement were adopted here the existing universities and medical schools would supply the instruction, but, if not, the University of the State of New York, with the aid of a State appropriation, could readily find some way of supplying the need; and the natural order of progress is the school first and the requirement of a degree afterward.

I have dwelt thus at length on the first essential of an efficient system of public education in the control and prevention of tuberculosis, not because it would have been difficult to enumerate many special devices and to recount many interesting experiments in this particular field, but rather because, with an efficient

and trained health officer, such an enumeration becomes at once unnecessary. Here perhaps more than in any other field of preventive hygiene there is already a substantial literature and what one may call a special method of educational propaganda. I content myself, therefore, with laying down the broad propositions that it is the duty of the State to take the initiative not only in supplying hospitals and sanatoria for advanced cases, and in seeing that patients who are sources of danger to others are removed to them, but also in that still more essential education of the whole community in regard to the curability, sometimes communicability — where there is carelessness or ignorance — and preventability of tuberculosis, and that to this end the one indispensable consideration is a qualified health officer, or in the larger communities a health administration with an ample supply of qualified health officers at its disposal.

The most important means of preventing tuberculosis are the indirect means — those through which the vigor and immunity of the individual are assured. Pure air, nutritious food, temperance, cleanliness, a higher standard of living — these are the means by which at last tuberculosis is to be controlled; and it may well be, therefore, that out of this campaign against the least prevented of the preventable diseases may come that higher conception of the higher responsibility of the State for the health of all, even the least, of the citizens upon which the stability of human progress and the welfare of mankind depend.

THURSDAY, OCTOBER 17, 1907

THIRD SESSION, 9:30 A. M.

DR. ERNEST WENDE, Presiding

LABOR LEGISLATION IN ITS RELATION TO PUBLIC
HEALTH

BY ADNA F. WEBER, PH.D.

Chief Statistician, State Department of Labor

FRIENDS OF THE CONFERENCE: It will be a disappointment to you that Mr. Sherman, who has just retired from office as Labor Commissioner of the State of New York, is not here to present this subject. When he took office two years ago upon the solicitation of Governor Higgins, he was a lawyer of recognized standing and a man of broad vision and intellect but without special knowledge of labor problems. That knowledge he soon acquired and he took hold of the work of his Department and he is now leaving the Bureau of Factory Inspection practically reorganized and the methods almost revolutionized, bringing out a standard of efficiency that has never before been obtained. His considerable experience with the problems of this State made him a very valuable speaker to discuss this problem before a Conference.

LABOR LEGISLATION IN ITS RELATION TO PUBLIC HEALTH

While labor legislation pursues both moral and economic ends, it has primarily the same purpose as this conference — the conservation and improvement of the public health. Those who are most active in promoting labor legislation are more and more coming to realize the need of medical advice in framing and administering labor laws, while the medical profession, on the other hand, is necessarily turning its attention to the subjects of industrial hygiene and the employment in industry of women and minors, which are uppermost in the minds of promoters of labor legislation. Presaging the active co-operation of the medical men and the workingmen in securing better conditions of health in the future is the recent formation of committees from the trade unions to distribute literature on the prevention of tuberculosis, as well as the organization of a national committee of 100 for the establishment of a Federal bureau of health. The medical men most actively interested in the attainment of this desirable object are particularly anxious to enlist the sympathy

and influence of laymen, and they have welcomed the co-operation of persons who are prominent in the promotion of labor legislation.

ORIGIN OF LABOR LEGISLATION

As to the close relation of labor legislation to the public health, it will be useful to recall the origin of such legislation in England just about a century ago. The earlier legislation relating to laborers was so wholly different in scope and purpose that it may not properly be classed with modern enactments for the protection of the *wage earner*, who is himself a development of recent times. He has little in common with the artisan or craftsman of the middle ages, whose working-life, with few exceptions, was divided into the three stages of apprentice, journeyman and master. Of course there existed alongside the craftsmen of the middle ages a body of agricultural laborers, who had as a rule risen out of serfdom; but legislation specifically affecting them was not of the protective character. Queen Elizabeth's famous "statutes of laborers," for example, attempted to regulate wages in the interest of employers, and it, therefore, established maximum rather than minimum rates of wages.

It was the growth of capital and the development of the factory system that split the craft guilds into the two classes of employers and employees and created the industrial problems that we face to-day. The factory system, as is well known, took its rise in the textile industry of England, where machinery operated at first by water and later by steam power permitted the utilization of unskilled labor in the processes of manufacturing and led to the employment of women and children in place of men. In the place of the old workroom with its few masters, journeymen and apprentices all laboring together under the same conditions, there grew up the large factory in which were massed many operatives of both sexes working in subordination to a superintendent and foreman. Children who no doubt had previously helped their parents in the home were brought into the mill to perform the lighter tasks, but the change of employment was a most harmful one, for it meant their subjection to a mechanical routine that broke down their spirits and undermined their health. The worst effects of the new system manifested themselves among the pauper children, who were leased or transferred in droves from the poorhouses to the mills. This class of children had been subjected to much neglect and ill-usage even under the

guild system when they were let out as apprentices. In factories, where they were concentrated in much larger numbers, the abuses attracted more attention. As early as 1784 the breaking out of an infectious fever in one of the Lancashire cotton mills brought on an investigation by medical men, chief of whom was a distinguished physician of Manchester — Dr. Thomas Percival, founder of the Manchester Board of Health, as well as its literary and philosophical society. He and his friends failed to trace the fever to its origin, but they diagnosed the effective cause, and their conclusion and recommendations tell us the whole story:

“We are decided in our opinion that the disorder has been supported, diffused and aggravated by the ready communication of contagion to numbers crowded together; by the accession to its virulence from putrid effluvia, and by the injury done to young persons through confinement and too long-continued labor: to which several evils the cotton mills have given occasion. * * * We earnestly recommend a longer recess at noon and a more early dismissal from it in the evening to all those who work in the cotton mills, but we deem this indulgence essential to the present health and future capacity for labor for those who are under the age of fourteen; for the active recreations of childhood and youth are necessary to the growth, the vigor and the right conformation of the human body. And we cannot excuse ourselves, on the present occasion, from suggesting to you, who are the guardians of the public weal, this further very important consideration, that the rising generation should not be debarred from all opportunities of instruction at the only season of life in which they can be properly improved.” (Hutchins and Harrison, *History of Factory Legislation*, pages 7–8.)

The county magistrates returned a vote of thanks for the report, ordered it printed and distributed and passed a resolution that in future no poorhouse children should be indentured to “owners of cotton mills and other works in which children are obliged to work in the night or more than ten hours in the day.”

In this modest resolution of the magistrates of the county in which the modern factory system had its origin, we see typified the growth of factory legislation throughout the world in the nineteenth century. In England there were other epidemics and other public investigations until Parliament enacted Sir Robert Peel's bill, known as the “Health and Morals of Apprentices Act, 1802,” which limited the working hours of apprentices to twelve

a day and abolished night work; required the provision of proper clothing, sleeping apartments and instruction in the three R's, and further required factories to be whitewashed twice a year and at all times properly ventilated, etc. From this beginning factory legislation in England was slowly extended to cover all children and forty-two years later to women also. At first applicable only to cotton mills, the factory acts were gradually extended to other textile mills, then to nontextile works (1864), and finally (1867) to virtually all manufacturing establishments operating power machinery. Efficient inspection, the foundation of the whole system of labor protection, was established in 1833. The historians inform us that the English factory laws were "always primarily sanitary or educational in aim. * * *

As economic measures, the various acts have stood almost entirely on the defensive." The controlling idea was not to destroy or hamper individual initiative that was socially profitable, but to raise the level of competition by requiring all competitors to provide as generously for the employees as did the more liberal and humane employers. Thus one of the resolutions drawn up in 1796 by Dr. Percival for the Manchester Board of Health in favor of a national factory law was as follows:

"From the excellent regulations which subsist in several cotton factories, it appears that many of these evils may be in a considerable degree obviated; we are, therefore, warranted by experience, and are assured we shall have the support of the liberal proprietors of these factories in proposing an application for parliamentary aid (if other methods appear not likely to effect the purpose) to establish a general system of laws for the wise, humane and equal government of all such works."

NEW YORK CHILD LABOR LAWS

As the factory system grew up in other countries, the English experience in a greater or less degree has been repeated; the Southern States with their new manufacturing enterprises, for example, are just now enacting their first child labor laws. But other countries have had the benefit of English legislative experience and have, therefore, advanced more rapidly. Our factory legislation in New York did not begin until 1886, but we have already advanced considerably beyond the mother country in our laws for the protection of child workers. We do not permit children to enter a factory until they are fourteen years old, whereas

the minimum age in England is twelve years; and our law treats factory workers between fourteen and sixteen years of age as children, while the English Factory Act defines as children those under thirteen years of age and those under fourteen who have not obtained an educational certificate. This State requires that every child working in a factory must have on file with its employer a certificate properly executed by a health officer, or by a person duly authorized to issue such certificate, in accordance with the provisions of section 71 and 72 of the Labor Law.

Section 71 was amended during the last legislative session, and every person authorized to issue employment certificates should at once familiarize himself with the amended law to the end that its administration may be intelligent and uniform throughout the State. Three material facts must be satisfactorily established before a certificate should be issued, to-wit: Age, educational qualifications and physical fitness. Evidence of age is of primary importance under the law, and recognizing the difficulty of securing satisfactory evidence the statute provides that such evidence as falls in one of five distinct classes may be accepted. It is urged by the Commissioner of Labor that a sincere effort be made to get a transcript of the birth certificate, which certificate shall in all cases be accepted as conclusive proof of age. The school record should be very carefully scrutinized to see that it is in conformity with the requirements of section 73. We have known of many instances where a school record had been given to a child who was not entitled to receive it. It is the duty of the officer issuing the employment certificate to examine the child in order to determine its ability to read and legibly write simple sentences in the English language. On the question of physical fitness too much cannot be said. The future of the child depends on the nature of the examination it is subjected to. Defective eyesight, weak lungs, deformities and other physical conditions should receive careful consideration in connection with the work the child intends to do.

It is hoped by the Department of Labor that every officer issuing certificates fully realizes the importance of his work. He is an essential factor in the proper solution of the child labor problem. Therefore, the service rendered should be entirely free from perfunctoriness. The records showing the evidence upon which certificates are issued should be carefully preserved so as to be available for examination at any time, and correct lists should be filed monthly in the Bureau of Factory Inspection, showing the total number of certificates issued.

Another important point to be remembered is that "vacation certificates" are no longer recognized in factories, and it would be well to differentiate between factory and mercantile employment certificates so that manufacturers may avoid the annoyance incident to having a child on a "vacation certificate" — Such certificates, when issued, should bear the words "*Not good in factories*," in large type, stamped across the face.

We would further suggest that factory employment certificates be printed on white paper and mercantile certificates on blue paper. This in time would obviate all confusion as to the interchange of certificates.

The success of the Department of Labor in its effort to stamp out illegal child labor in the factories of the State depends to a great extent on the degree of thoroughness which shall characterize the work performed by the various boards of health. It is, therefore, hoped that hearty co-operation shall mark their relation to the Department.

HEALTH PROVISIONS OF THE NEW YORK FACTORY LAW

Limitations of time prevent a complete enumeration of the health provisions of the labor laws of New York, which in the modern view are subject to a rather broad interpretation. For example, the demand of the wage worker for an eight-hour day, so far as it has been based on the argument of health, has been a matter of raillery on the part of professional men and others unused to manual labor. But expert evidence has accumulated of late which goes a long way to fortify the trade union argument for a shorter working day in the interest of the public health. Some six years ago a French physician* made an exhaustive study of the health of laborers, and concluded that the abnormal sickness and mortality among working people is due not simply to poisonous or noxious materials, but also to fatigue working on the nerves. That conclusion was strongly corroborated by the experience of L.-G. Fromont, the manager of a large chemical factory in Belgium, who last year published the story of the substitution of an eight-hour for a twelve-hour shift in his factory with most satisfactory results. In the first few weeks there was a loss in wages and product, but as soon as sufficient time had elapsed for the workmen to recuperate the power more or less

* Ilia Sachnine, *La journée de huit heures au point de vue de l'hygiène et de la médecine*, Lyon, 1900.

exhausted during the former long schedule of hours, they maintained and even increased the former output. The most convincing proof of their improvement in health was furnished by the factory sick benefit fund, which almost invariably showed a deficit until the shortening of the hours of work. Such circumstantial testimony as to the efficacy of the eight-hour day in America has not come to my attention, but an American practitioner of varied experience recently asserted in Harper's Magazine that "the trade unions were overwhelmingly right when they demanded as the first prerequisite for the mental, moral or physical improvement of the laboring man a shortening of the hours of toil. Nothing more degrading or benumbing to all that is best in human nature," says Dr. Woods Hutchinson, "has ever been devised than the grinding, treadmill routine of muscular labor which was exacted of the laboring world fifty years ago, and is yet exacted to-day in regions where laborers are unable to protect themselves. * * * It has long been known that the laboring classes have a low average longevity and a high disease and death rate, and they are subject to an enormous number of diseases from which, according to popular impression, their 'active, natural life' ought to have protected them. The percentage of cases of Bright's disease, of heart-disease, of nervous breakdown, of insanity, is higher among them than in any of the so-called leisure classes. Nor can alcohol longer be made the universal scapegoat. Overwork is a far more potent factor in their production than drunkenness."

The case for the limitation of the hours of work on the part of women employed in factories is of course much stronger and has led to legislative intervention in all advanced industrial communities. In this State the limit prescribed is sixty hours a week or, with certain exceptions, ten hours a day. Male minors (boys sixteen or eighteen years old) are subject to similar rules, while children (fourteen to sixteen years) of both sexes are now restricted to eight hours' work a day, between 8 a. m. and 5 p. m.

In addition to the child labor regulations and the foregoing rules as to hours of work, the Factory Law contains the following health requirements: Seats for female employees (§ 17); painting and whitewashing of walls and ceilings (§ 84); lighting (§ 81); overcrowding (§ 85); ventilation (§ 86); exhaust fans on dust-creating machinery (§ 81); washrooms and sanitary conveniences (§ 88); time allowed for meals (§ 89); special

sanitary regulations for laundries (§ 92), for bakeries (§§ 111-116), for tenement workrooms and shops (§§ 100-105), for tenant factory buildings (§§ 94-95).

The New York Factory Law ranks with that of Massachusetts as the most advanced in this country, but with the exception of its regulation of tenement manufactures and of the employment of children, as already mentioned, it is not to be compared with the Factory Act of Great Britain as a code of law adjusted to the peculiar situation and needs of the workers in each industry. The first nine sections of the English Act of 1901 relate specifically to the subject to health, as distinguished from the safety and the employment of immature workers, thus:

Section 1. Sanitary condition of factory.

2. Sanitary condition of workshops and workplaces.

3. Overcrowding of factory or workshop.

4. Power of Secretary of State to act in default of local authority.

5. Powers of inspector as to sanitary defects in factory or workshop remediable by sanitary authority.

6. Temperature in factories and workshops.

7. Ventilation.

8. Drainage of floors.

9. Sanitary conveniences in factories and workshops.

In addition to these general provisions, the English act contains special provisions in fourteen sections for regulating dangerous and unhealthy industries, which are in turn supplemented with upwards of thirty special orders framed by an authorized government official.

In the New York law the subjects of temperature and humidity are entirely ignored, and both omissions are often serious. The inspectors have occasionally ordered factory-owners to provide for the proper heating of workrooms under local ordinances, but they have not attempted to deal with excessive humidity, which is an important subject of regulation abroad. The lack of proper drinking water often in the lower grade factories causes hardship and ill-health, which the inspectors are powerless to prevent. Proper lighting of workrooms is provided for in the law, but we are nevertheless told by the closely observing English physician (Shadwell), who has recently given us the valuable study of "Industrial Efficiency" in England, Germany and the United States,

that "a bad light is the most conspicuous and general defect of American factory premises."

If Dr. Shadwell had inspected the myriad small workshops of New York city, he might have discovered uncleanness to be a still greater defect than bad light. Our Factory Law authorizes the inspector to order workshop walls and ceilings painted or white-washed at his discretion, but there is nothing in it "to require that workrooms shall be kept clean, except those special provisions that relate to bakeries, laundries, tenements and certain kinds of shops in tenant factories. These provisions cover the classes of workshops in which alone filth is at all common; but even in the better kinds of factories, left unregulated in this particular, injurious dust, waste and dirty matter are often allowed to accumulate. Pressrooms, even of some of the most reputable newspapers, are very bad in this respect, and show high rates of mortality and sickness. The more complete codes of European countries deal with this subject fully and prescribe frequent wet cleanings. Our code needs similar provisions; and also some special regulation to counteract the evil results from spitting."

The whole subject of ventilation has been inadequately regulated in our Factory Law. While it limited the number of persons to be employed in a workroom according to cubic air space and prescribed proper means of ventilation, it omitted to require rooms to be kept ventilated, and it was not until the present year that the omission was supplied by an amendment which also provides that "if excessive heat be created or if steam, gases, vapors, dust or other impurities that may be injurious to health be generated, * * * the room must be ventilated in such a manner as to render them harmless, so far as is practicable." The Factory Law had previously required that exhaust fans be provided to carry off dust from emery wheels, grind stones and other machinery creating dust, but it is only within the past year that a decision has been obtained from the courts holding buffing wheels which use tripoli composition mixed with stearic acid and tallow to be dust-creating machinery, despite the particles of copper that were thrown into the air to be breathed by the operative.

This section of the law has also been criticised by Commissioner Sherman as too rigid, causing unnecessary hardship and expense in cases where exhaust fans are almost useless. "Where one or two wheels only are used in uncrowded and especially well-ventilated rooms," he says, "other and cheaper methods

of keeping the dust away from the workmen are equally effective and should be permitted. And where the wheels are in tool or machine shops for only occasional use, to require an exhaust fan is nothing but a vexatious handicap upon industry."

Connected with the requirement just mentioned is another section of the law prohibiting the employment of women and minors in the operation of polishing or buffing wheels. The process of polishing is, however, the only process or trade subject to special rules in this State, whereas a large proportion of the labor laws of other countries is devoted to the regulation of dangerous and unhealthy industries. These include processes in which the material is of a poisonous nature such as lead, mercury, arsenic and phosphorus. Employers and workers in these and other of the so-called noxious or dangerous trades are required to exercise special hygienic precautions, and in numerous industries employment is restricted to adult males, as in the case of polishing and buffing in this State. Owing to the law requiring physicians to register cases of industrial poisoning coming to them in their practice, the public authorities of England are in possession of the necessary data for wise control of the processes involved. Last year there was not a death nor even a case of phosphorus poisoning, and while there are several cases of mercurial and arsenic poisoning notified each year, no deaths have been reported for some time. The most harmful of the industrial poisons is lead, which enters into the manufacture of so many different products; last year there were reported thirty-three deaths and 632 cases of lead poisoning in factories and thirty-six deaths and 181 cases in house painting and plumbing. Anthrax, arising out of the handling of wool, hair and hides and skins, was the cause of twenty-two deaths and sixty-seven cases.

While the five diseases referred to are the only ones that must be registered, there are many other dangerous trades recognized in the English law. Within the present year, for example, Parliament has added a dozen industrial diseases to the schedule of the Workmen's Compensation Act, which places the burden of caring for disabled workmen upon the trade or industry in which they have been employed.

As to the prevalence of such diseases in this country we are without accurate information, for no State has as yet required their registration or notification. A few of the trades have been investigated by the bureaus of labor statistics, especially that of

New Jersey. The New York bureau has made a beginning in the same field, having carried through last year an investigation of the health of printers on the basis of the experience of the International Typographical Union in insuring its members against death and of local beneficiary funds for sickness insurance. The results demonstrate that in this trade at least our workmen are exposed to fully as great risks as are the English workmen, the mortality of compositors from pulmonary tuberculosis, pneumonia and other diseases of the respiratory system being higher in New York city than in London. With the assistance of our new medical inspector of factories, we hope to continue the investigation of the unhealthy industries in this State, which, however, are not so numerous as in some of the other Commonwealths.*

MEDICAL INSPECTION

This officer, the first of that title in the United States, will of course be chiefly occupied in the control of sanitation in the general run of factories and in the examination of children who have attained the legal age but are physically unfitted for certain kinds of employment in factories. The need of such an officer is set forth in the report of former Commissioner Sherman, who says:

"Although about half of the factory laws relate to disease and sanitation, there has never been a single medical officer in the Department. The deputy factory inspectors are competent to discover insufficient ventilation, where odors or extreme oppressiveness betray it; they can see breaks in plumbing, have more than the usual layman's ability to detect disease, and are of course perfectly competent to cope with obvious filth. Therefore, in dealing with grossly unsanitary conditions they are fully competent and have done splendid work, especially in tenant factories and tenement houses. * * * But when higher standards or more difficult questions of sanitation are reached, medical judgment, direction and support is wanted. Courts that will accept a mechanic-inspector's description of overcrowding or filth as evidence of unsanitary conditions will hardly enforce his unsupported opinion as to defective ventilation, etc. And the proprietors of the better classes of factories, who acquiesce readily in the advice or orders of such inspectors in regard to machinery or safety,

* Diseases of occupation are exhaustively treated in the work on *Dangerous Trades*, edited by Dr. Thomas Oliver of London. The considerable literature on the subject is almost wholly European.

cannot be expected to accept his decisions upon doubtful questions of sanitation. Therefore, all orders of a mechanic-inspector relative to sanitation, to which there is any objection, should be reviewed and affirmed by a medical expert before a dissatisfied proprietor should be expected to comply with them or before they should be enforced by legal process. Moreover, there must be many points in sanitation as to which our inspections could be improved if the present staff had proper technical instruction and direction. And, assuming that it is a proper function of factory inspection to *advise* whatever is reasonably necessary for health, whether required by law or not, and that the majority of proprietors of factories proper would comply with such advice if convincingly explained regardless of legal obligation, it is obvious that many improvements might be induced by expert sanitary inspections. And to perceive the defects of existing laws as they are disclosed in operation and to devise proper measures to correct them requires medical co-operation and investigations. Finally, it is a question for medical investigation whether the existing regulations relative to the labor of women, minors and children cannot be improved so as to make them more beneficial and effective as regards such persons and yet at the same time more easily enforceable and less embarrassing to industry. I have, therefore, always insisted that the need of medical advice in the Bureau of Factory Inspection is imperative; and the last Legislature accordingly provided for one medical inspector of factories."

I might add in conclusion that it is my own expectation and belief that the first medical inspector will so justify his appointment as to necessitate some additional inspectors.

DISCUSSION

Mr. STANLEY ROBINSON (Factory Inspector of the Health Department of the city of Buffalo)—I want to speak of the work that is done by the board of health in the inspection of mercantile establishments in the city of Buffalo.

In the first place there are two inspectors to do the work in the whole city. That takes in from south of the City Hall, four and one-half miles to South Park avenue, to Tonawanda and O'Neil streets on the north side, four miles. And from the foot of Main street to the city line, Winville road, about six miles. The inspection has to cover everything within the city line. There are about 1,810 streets and alleys, but we do not walk in all of them but only those that have stores and employ help.

In 1906 the two inspectors, myself and my assistant—and, by the way, my assistant is a lady; that ought not to be, it ought to be a man because the inspector has to go into places where it isn't fit for a lady to go into, but we are restricted by salaries and, therefore, have to employ a woman—in 1906 the two inspectors made 8,223 inspections. This year up to October 1st we have not made much more than half that number (4,433), for the rea-

son that the time of the inspectors has been taken up in making out working certificates. The working certificates issued in 1906 were 2,293 and in 1907, up to October 1st, 2,387. And added to this were 468 refusals of certificates, which required just as much work as issuing the certificates, making a total of 2,855 employment certificates issued and refusals made. In the refusal certificates we have to state the reason for the refusal, addressed to the parent or guardian, and signed by Dr. Wende. Each applicant for a certificate to work must show a certificate of age by birth, baptismal or passport record; number of days in school and then we have to weigh them, take their height and state in the certificate the color of the hair and eyes and any other peculiar mark which might identify them. But the children will alter the certificates to bring them within the law, and we have known where children have sold their certificates to other children. There should be a penalty for so doing. Now you will say — what penalty can you put upon a child? Well the same penalty that my father gave me for lying the first time to him. Invite him out in the backyard and interview him.

Now, about the consistency of the law. The gentleman who preceded me has given you a very elegant paper and it is full of force, but it is a good deal more, it is full of terms that you cannot understand, and it is truly impossible with the Labor Law that is in force to-day for the ordinary business man to understand it. It requires a Philadelphia lawyer to understand it, and I do not think that he could do it justice. The Labor Law says that no children shall work until they are fourteen years of age and then they must get out their proper certificates. Now, the Education Department will issue permits to a boy to sell papers in the streets, where he can stay out until the Lord only knows what hour, 11 and 12 o'clock, and the same child when working under a labor certificate, issued to him, would have to quit at 7 o'clock.

The law prevents them from working in stores and mercantile establishments, in a nice warm place, after 7 o'clock in the evening, but they can go out on the streets and play craps and pitch pennies until they feel like going home. Now, I do not know which is just. I think I would rather keep the child at work.

Indeed in relation to that I would like to relate a little incident that occurred to me a while ago. No child under sixteen can be permitted to work in any establishment of a mercantile nature or otherwise after 7 o'clock. I was sent out with Miss Wright, my assistant, on Saturday night to go to department stores to look after delinquents, if any. I went into a store run by the gentleman who spoke to you yesterday, the Hon. J. N. Adam. I came across Mr. Adam. "How are you, Mr. Robinson," he said, "what are you doing." "I am looking to see that you are complying with the law." He said, "Is that all? Why just as soon as the clock strikes seven you can't find a boy or a girl in this store even with a search warrant. They are in too great a hurry to get out on the streets." He said that around half-past seven or eight these boys, or a lot of them, were crowded out at the back of the store on Washington street playing craps and made such a devilish noise that they had to telephone for a policeman to disperse them. And he said he asked one of the boys where they went when they stopped playing craps out there and he said some of them went to the Lafayette theatre, and some went down to Academy theatre, two of the worst places in Buffalo that should be shut up entirely or at least prevented from allowing children under sixteen years of age to enter.

Make it a State law for both mercantile and factory establishments to have State inspection, inspectors for both of them. We have two for the city of Buffalo, and there is work enough for them to examine and make out working certificates. To issue 2,855 certificates in nine months takes up the full time of one man and sometimes two, and we have over 8,000 stores to inspect. It is impossible for the inspectors to get around and make inspections and do that work in the office. And the gentleman stated that the man who issued certificates should be very particular to state about the eyes and ears of the child and its general health and whether it had any contagious disease, any pimples or things of that kind. The inspectors in

that case would have to be physicians if they would issue certificates and see to all this about the child. Now, thank God, I am not a physician. And I want to say that if such a law was passed I should step down and out, because I should not be a fit and proper subject to pass upon the question of whether the child had any eye disease, earache, belly-ache or pimples.

My advice to this gentleman, is this, and please take it to the Commissioner. If he wants to get up an elaborate law that is fair and square to the employer, remember to the employer as well as to the working boy and girl, get the inspectors who are up against the real thing every day—they have got no rules; their's is practice—get them together from, say, the cities of the first, second and third class, in a convention and get their ideas and their experience in these inspections and then make your laws. But as brevity is the soul of wit, for heaven's sake let it be the soul of the law. There is so much verbiage, so many rules. Get it right down to about four or five pages and have it say just what it means and then you can enforce it. If you give ten lawyers a copy of the law, as it stands to-day, and ask them to give their interpretation of it, you will get ten different versions; and how do you expect the ordinary, common, poor fellow like myself, who does not know anything about law, to interpret that law?

Now, about vacation certificates. The wisdom of the Legislature, assisted by the labor organizations of the State in their wisdom, prepared to issue vacation certificates for the two months during the time when the schools are closed—from the 1st of July to the 1st of September. They cut out the city of New York and the city of Buffalo—these are not allowed to issue any vacation certificates. Now these are two cities that need it more than the balance of the State altogether. When we had the right we issued in one season about 1,500. But just across the city line a child can get a certificate issued to him for his vacation if he is over twelve and he does not have to have any school examination to work during these two months. In the city of Buffalo they cannot work at all and they go out and get full of deviltry and into places where they should be kept out of. They get into mischief and we are only planting the seeds of reformatories, penitentiaries and State prisons. The vacation certificate rules should be made uniform throughout the State; also the certificates themselves. They should be uniform and the certificate issued in one part of the State should be good in another.

Parents should be given the right to have their own children work for them before and after school, provided the principals of the schools certify to their attendance. Children should be made to attend the schools, public and parochial, until fourteen years of age, which is the age required by law.

And I want to say that the Commissioner of Health should be empowered to appoint an attorney to attend to all cases of violations of the law in tenement-houses, sanitary conditions and Labor Law cases. It should not be expected that we should attend to these affairs and cases here in the city, as the city attorney has his hands full. And then there is so much legal technicality when you undertake to prosecute a man for violating the Labor Law. I want to know if the officer before whom we bring a case has the right when he grants an adjournment of thirty days for the man to procure the necessary certificates for the child to work, to say to that man—Oh, yes, you can keep that child at work during the time you are getting out the certificate! If he can find anything in the law which gives him the right to say that, I have yet to find it, and I have been looking at it very carefully. I want to know if the law is mandatory or discretionary. The law says that any man who violates the Labor Law shall be fined. But the court does not always take such a view. It says, well, you are a nice man, etc., and lets him keep the child at work until the certificate is ready. What good does that do? It makes a laughing stock of the inspector, and I won't say what it does to the violator and the child, and the judge who thinks this way. Of course you cannot say a word, you cannot kick; he is the supreme power; he would send you up for contempt of the court—but then I never have expressed my contempt of that court. I never could find anything to express my contempt of that court.

There is one thing I want to see in the law that is a very good thing, and it is due to the employer. Mercantile establishments should be exempt from the operations of this Labor Law, from the 15th day of December until the 31st day of the same month, for the reason that the public demands it. The public demands that these people keep open around Christmas, and I think it is no more than right and just as well as generous to the children to allow them to work a little while longer, and there are no stores in Buffalo but what remunerate their children well for working.

I would have all inspectors, both mercantile and factory, stamp certificates that have expired, stamp them expired by limitation, and date them. It would help wonderfully; it would prevent the children from swapping them off and you do not know what we are up against in this mercantile inspection. These children forge certificates. I have one here with me that is forged. They will forge even the birth certificates.

SEWAGE DISPOSAL FOR INSTITUTIONS AND SMALL COMMUNITIES

By THEODORE HORTON, C.E.

Chief Engineer, State Department of Health

In presenting a paper upon an engineering subject so highly developed as that of sewage disposal, one's first impulse is to deal with it from a more technical point of view, or to present only such knowledge as is based upon the latest discoveries or experiments. The speaker's experience, however, has convinced him that it is not so much knowledge of this nature that is desired among our State sanitary fraternity as it is a knowledge of fundamental principles, and of the application of these principles in daily practice. If I am not correct in this view, I hope that I may be pardoned for presenting, in so elementary a manner, what I have to offer upon this subject this morning.

I wish, first, to explain briefly about the origin and composition of sewage, and the standards by which proper methods of sewage disposal are compared or judged; then to describe the various methods which are at present successfully practiced in the purification of sewage; and finally to discuss these different methods with respect to the quality of their effluents, and to their applicability to small communities and institutions.

Sewage has been variously defined by sanitarians as water which is dirty or defiled, or to which they apply some adjective suggestive of physical characteristics or appearance. Since, however, the origin of sewage, more particularly domestic sewage, is the public or private water supply, it has become customary for engineers to consider domestic sewage as the spent water supply. There are, of course, other kinds of sewage, as, for instance, industrial, combined and mixed sewages, which are derived either from specific industries, or from variable mixtures of domestic sewage, industrial sewage and surface water. These latter classes of sewage, however, will generally require special methods of treatment, and since they will rarely be met with in smaller communities or institutions, will not be considered in this paper.

Considering, then, purely domestic sewage, we find that it is derived from the portion of the public or private water supply used for strictly domestic purposes. This will include the water used for drinking, cooking and culinary purposes; for the laundry, the stables and the lawn; and for the removal of human excreta. If we assume that the original water supply be practically pure and wholesome — one, for instance, derived from an uninhabited watershed, having a gently sloping topography, a sandy or igneous rocky surface, free from swamp lands, and compare with it the sewage derived from its domestic consumption, we find a marked and interesting contrast.

The water derived from such a watershed will be comparatively low in mineral and organic matter. There will be no clay deposits of a sedimentary nature, nor soft rocks of a solvent nature, to give rise to any appreciable amounts of suspended or dissolved mineral matter. Nor will there be any swamp lands, or ponds, in which microscopical organisms can develop, to give rise to any considerable amounts of suspended or dissolved organic matter. What bacteria are washed from the uninhabited slopes, and are retained in suspension in the stream, will be of a harmless variety commonly known as a water bacteria. Finally, and what is of most importance, this water will be practically saturated with oxygen; that is, during its passage through the air as rain, and its flow over, or through, soil that is thoroughly aerated, it will have absorbed as much of the atmospheric oxygen as it is capable, and, in the absence of any considerable amount of organic matter, or microscopic organisms, it will retain its condition of saturation.

Contrast the same water after it has been used in the household for the various purposes outlined above and has been discharged into our system of sanitary sewers. It will now be highly charged with organic and mineral matter, derived from the wastes and washings of the household. The bacteria, which in the original water number only a few per cubic centimeter, will have increased to somewhat more than a million. The dissolved oxygen will have been reduced from a condition of saturation to practically zero, having been consumed in the process of decomposition carried on through the agency of the bacteria.

If the sewage be fresh, or if it be relatively low in organic matter, or for other reasons the supply of oxygen be not exhausted, there will be little, if any, odor to it. If, on the contrary, the

sewage be stale, or highly charged with organic matter, or subject to a condition of active decomposition, in the absence of oxygen, the sewage will become offensive. In other words, so long as there is oxygen present in the sewage, decomposition takes place slowly, under aerobic conditions, without the production of gases; while as soon as the supply of oxygen becomes exhausted, decomposition continues, under anaerobic conditions, with the evolution of gases, some of which, like sulphurated hydrogen, are offensive. This decomposition under anaerobic conditions we usually term putrefaction.

Considering the composition of domestic sewage more in detail, we find, in our American communities, that it contains from 400 to 500 parts per million of total solids. Of these solids, about two-thirds are found to be in suspension and about one-third in solution. Again, of the suspended solids, about two-thirds are organic matter and one-third mineral matter; while, of the dissolved solids, about one-third is organic matter and two-thirds mineral matter. It is, in fact, this small amount of organic matter, less than five one-hundredths of 1 per cent., which gives to this class of sewage its objectionable qualities, and renders it at times difficult of purification.

When sewage of this character is discharged upon land, or into a body of water, it becomes objectionable, usually in one of three ways. It may, in the first place, become objectionable in appearance, due to the floating or fine suspended matters present in the sewage. These matters tend to form unsightly deposits upon the bed and banks of a stream, and to interfere in many ways with the industrial or pleasure purposes for which a stream may be used. This objectionable feature, while affecting mainly the æsthetic quality of a stream, and only those persons or industries that actually use the water, does not in itself affect public health.

In the second place, sewage may become offensive as a result of a diffusion of gases, resulting when decomposition is carried to the point of putrefaction. Although this feature affects the comfort of those living along or in the vicinity of a stream, the most careful investigations fail to reveal that it has any serious effect in producing specific diseases.

Finally, sewage may become objectionable through the dangerous ingredients contained in it, which affect the health of human beings. These are the pathogenic or disease-producing bacteria frequently present in the sewage. They enter it from a variety of sources — such, for instance, as from human discharges,

or from laundry water in which the clothing of sick persons has been washed, or from sewage derived from hospitals. Where sewage of this character is discharged into bodies of water, used subsequently for drinking purposes, it is evident that the transmission of disease is invited.

Any method of sewage disposal, then, must have for its object the fulfillment of one or all of the following requirements, viz.: to remove the coarse and fine suspended matter; to prevent offensiveness to the body of water or land into or upon which the sewage is discharged; and to render harmless the disease germs contained in the sewage. The extent to which these requirements must be fulfilled, in any case, will depend upon the volume, the character and the uses made of the stream into which the sewage is to be discharged. Although there are no set rules that can be strictly adhered to, we may make the following generalizations with respect to such requirements:

First, where a stream is not subsequently used for a public water supply, but where its æsthetic or industrial qualities are important, and where the volume of flow is so large, as compared with the volume of sewage, that offensiveness will not result, it will be only necessary to remove the suspended or floating matters by efficient screening or settlement.

Secondly, where a stream is not used subsequently for a public water supply, but where the volume of sewage discharged into it, compared with the volume of flow, is so small that offensive odors may arise, it will be necessary, in addition to the removal of suspended matters, to remove or oxidize the organic matter in the sewage. This can only be done by means of sewage purification, and the effluents under these conditions must be what is termed stable, *i. e.*, purified to such a degree that it will not of itself, or when discharged into the stream, subsequently putrefy.

Finally, where a stream is to be subsequently used for a water supply not adequately protected by water purification, it may be necessary to remove all substances from the sewage, including the bacteria. It is only fair to state, however, that this standard of bacterial removal has never been attained in practice by any method of sewage disposal yet devised; nor, in fact, was such a standard originally contemplated in the early days of the art of sewage disposal, when the only object was the removal of organic matter and the prevention of a nuisance. The present demands for higher standards are of comparatively recent origin, brought about through a keener appreciation of the dangers of stream

pollution and a more advanced knowledge of the art of sewage purification.

Let us now consider some of the methods which are practiced to-day for the disposal of sewage, and compare in a general way their relative merits in fulfilling the requirements outlined above. Perhaps the oldest and most generally utilized method of disposal is that of discharging the raw sewage directly into a stream or other body of water — more technically known as the “method of dilution.” Since this method, as outlined above, is applicable only in cases where a stream is not subsequently used as a water supply, it becomes evident at once that its utility in localities like that of New York State must be very limited. This method having, however, a limited applicability under proper restrictions, it becomes necessary to know *what degree* of dilution will prevent offensiveness.

Experience gained from a study of numerous cases in Europe and America indicate that, whereas no specific rule can be set down, applicable to all cases, there are certain general standards which may be safely followed. The unit usually adopted is the amount of flowing water which is required to properly dilute the sewage of 1,000 persons after it has been thoroughly dispersed through the water-section. When this volume is less than three cubic feet per second, the dilution is not sufficient to prevent offensiveness, even under favorable conditions. When it is greater than seven cubic feet per second, there is rarely produced any offensiveness, even under unfavorable conditions. Between these limits, then, of three and seven cubic feet per second must lie our standard of dilution for any particular case — depending upon the character of the water, the strength of the sewage, the addition of manufacturing wastes and the existence of mill ponds, or stagnant pools, where deposits may occur.

If, then, a community is favorably situated, with reference to a large body of flowing water, the method of dilution becomes a satisfactory one. If, however, it is not so favorably situated, or if the sewage must enter a stream or river which is subsequently used as a source of water supply, or if it is discharged into tidal waters in proximity to oyster beds, this method must be abandoned in favor of some method of artificial purification.

Of these artificial methods perhaps none is more effective than that of filtration, or the slow percolation of the sewage through beds of porous soil or sand. This method has been used for more than a century. It is, in fact, nature's method of purifying dirty

water, which, after rains, flows over the surface of the ground, descends slowly through the pores of the earth, and finally issues as pure spring water.

This method of filtration has been very thoroughly studied for many years, in this country and abroad, and it is now possible to foretell, within narrow limits, how much sewage of a certain composition can be successfully purified when the quality and the size of the sand grains are known. Generally speaking, an acre of good effective sand can be so arranged as to purify indefinitely the sewage of about 1,000 persons. If the sand is coarse and deep, or the sewage has received some preliminary treatment to remove the suspended matters, a still larger amount of sewage can be treated. If the sand is fine, or mixed with loam or clay, this amount must be correspondingly decreased, reaching almost nothing for soils composed mostly or wholly of clay.

It is usual to arrange sewage filters in beds, or units, of a definite size, with the surface nearly level, to insure a uniform distribution of the sewage. Beneath the surface, at a depth of a few feet, is laid a system of collecting pipes or underdrains. The sewage is applied in turn to each of the beds, and, after percolating slowly through them, is collected in the system of underdrains and discharged into the nearest water-course.

When beds of porous material are not available, or land is expensive, it is frequently found more economical to purify sewage by some other method than sand filtration. Of these methods, chemical precipitation has been satisfactorily practiced in the past, and although this method has given way to more economical and effective methods, it is still practiced in many places.

By this method the sewage is passed through tanks, after it has been treated with certain chemicals, such as lime, or salts of alumina and iron. The sewage may be passed slowly through the tanks at a uniform low velocity, or tanks may be filled, allowed to stand for a period of time and then discharged. In either case, the chemicals unite with certain constituents in the sewage and form a coagulum, which settles to the bottom of the tanks, carrying with it and precipitating upon the bottom the suspended matters of the sewage. The relatively clear effluent is then passed off and discharged into the nearest water-course or subjected to further treatment.

This method of disposal at the present time is not considered a complete one in itself, but is practiced as such in some places, and is frequently employed as a preliminary treatment. The

difficulty of disposing of the sludge, the high cost of chemicals and the low purification effected make this method, however, a comparatively expensive one, and the field of usefulness restricted to peculiar local conditions or to the disposal of certain classes of trade wastes.

Of greater utility than the chemical precipitation tank is the so-called septic tank. The origin of this appurtenance in sewage disposal is our well-known cesspool. In fact the septic tank may be considered nothing more than a large cesspool, scientifically constructed and operated, so that the highest biological efficiency is attained. If, then, through a long and narrow tank domestic sewage is allowed to pass, certain results are obtained, depending upon the rate at which the sewage flows. When this rate is relatively high, *i. e.*, the period of detention in the tanks is less than say, four hours, we get a mere settling or sedimentation of the sewage, *i. e.*, a merely mechanical result, with no appreciable biological action. When this rate of flow is lessened, however, and the detention period increased to, say, eight hours, we secure entirely different results. Instead of mere mechanical subsidence, we have, in addition, a bacterial or septic action which produces marked changes in the organic matter.

The biological processes carried on in the septic tank are rather complicated. They are also quite variable in activity, depending upon many factors, such as the composition and age of the sewage, its temperature, the period of detention and the velocity of flow through the tank. The process may be briefly described as one in which decomposition is allowed to continue until the sewage putrifies. The bacteria, working under anaërobic conditions, are able to break down the more complex and unstable organic compounds, and convert them into simpler and more stable ones. This conversion results in a liquefaction of portions of the suspended organic matters, and a liberation of certain gases, such as sulphuretted hydrogen, marsh gas and ammonia. The portion of the suspended organic matters not liquefied either rises to the surface to form a scum over the liquid in the tank, or settles, together with the mineral suspended matter, not previously removed by settling or screening, to the bottom of the tank, in the form of sludge. This sludge must be removed, from time to time, and disposed of by special treatment.

The septic tank thus fulfills a two-fold object: the removal by subsidence of a considerable portion of the suspended organic

and mineral matters, and the decomposition and liquefaction of a large part of the suspended organic matter. The organic matter thus converted is in a condition which many believe to be better suited to subsequent oxidation and nitrification than is the case with the raw sewage. And whatever may be said against the economic value of the septic tank, there is little question but that properly septicized sewage is more easily treated than either raw sewage, or sewage that has been subjected to plain or chemical precipitation, and that the septic tank will continue to be a useful preliminary device in sewage disposal for many years to come.

The treatment of either settled or septic sewage is usually accomplished by means of sand filtration, previously described, or by means of coarse grained or rapid filters. Of the latter class of filters there are two general types; the contact bed and the sprinkling filter. Although both are composed of the same materials—a mixture of coarse stone, gravel or coke—and are usually laid out in beds or units, their construction and operation are somewhat different.

The contact bed is usually constructed as a tank, in which the filtering material of graded sizes is deposited, with the coarser material at the bottom. The sewage is run onto the bed until it is full, and is allowed to stand in contact with the filtering material for a definite period of time. During this interval, and under the conditions of ample supply of oxygen, the organic matter is rapidly acted upon by the aërobic bacteria, until it is oxidized or nitrified, *i. e.*, subjected to the last chemical change, or action, in the process of decomposition. At the expiration of this time period, ranging usually from two to four hours, the purified liquid is drained from the bed and discharged into the nearest stream, or subjected to further treatment.

With the sprinkling filter, the construction is almost identical with that of the contact bed, except that the walls surrounding the filter may be omitted. The sewage is, however, applied in a very different way. Instead of flooding the filtering material, the sewage is distributed, through nozzles, over the beds, in the form of spray, and allowed to percolate through them to the underdrains beneath. In this way a better opportunity is afforded for aëration and nitrification, and results show that, not only is the bacterial efficiency of the sprinkling filter higher than that of the contact bed, but that, owing to the better oppor-

tunities for oxidation, a larger volume of sewage can be purified per unit volume of filtering material.

The effluents from both contact and sprinkling filters, though stable in themselves, and generally of satisfactory quality to be discharged into any water-course, are, however, not entirely free from suspended matters. Fine, and sometimes rather coarse, particles of the film, or coating, attached to the stones of the filters, which form harboring places for the bacteria while performing their work of nitrification, become dislodged and are carried into the effluent. These particles are mostly stable, inert matter, relatively coarse and heavy, and subside quickly when the velocity of the effluent is checked. When it is desirable, then, to remove this suspended matter, and secure a clear effluent, it is only necessary to pass the effluent through a settling tank of moderate size and allow the suspended matter to settle out.

Again, we find that the effluents from these rapid filters are not entirely free from bacteria, and in some cases they show a very incomplete removal. These bacteria are, in a large measure, carried into the effluent along with the other suspended matters just described, and are probably of the harmless variety of nitrifying bacteria that have developed either in the septic tank or in the filter. It is also probable that many of them are of the pathogenic species originally present in the sewage, so that there may be cases where it is desirable or imperative to remove not only the suspended matter, but also the bacteria. When this standard of purity is demanded it becomes necessary to resort to supplementary treatment either along lines practiced for the purification of water, such as mechanical or slow sand filtration, or by some method of sterilization.

In passing it may be noted that this stage in the process of sewage purification represents the connecting link between problems of sewage disposal and water purification. The effluents from rapid sewage filters may be very properly compared with the turbid waters of many of our streams, which have received some pollution, and their purification can be accomplished not only in the same degree, but in the same manner as such waters. It will, of course, be rarely, if ever, demanded in practice, that a potable water shall be produced from a sewage effluent, but what may frequently be demanded, especially in the future, is an effluent that is not only sufficiently purified of its suspended or

other organic matters to pass the test of stability, but one in which all of the bacteria shall have been removed or destroyed.

Although mechanical or slow sand filtration can, as suggested above, accomplish these results, recent studies and investigations indicate that it may be accomplished by the simpler and less expensive method of sterilization. In fact, the final purification of effluents represents the most fruitful field of sewage experimentation at the present time. These experiments seem to indicate that sterilization may be accomplished most satisfactorily and economically by treatment with certain chemicals, such as lime and copper sulphate, or by ozone and chlorine, generated electrically from the atmosphere, or from certain salts. The study of the final treatment of effluents, as with that of preliminary treatment of sewage, resolves itself then mainly into one of relative cost and, at the present time, the sterilization of effluents by chlorine or ozone seems to give the greatest promise.

It is clear then, from what has been said, that there are a number of methods of sewage disposal, including preliminary and final treatment, by which it is possible to secure an effluent having almost any desired purity. The question as to *what standard* shall be demanded in any case can only be arrived at after the most careful study of local conditions with respect to stream flow, and of the dangers of infection resulting from a subsequent use of the water. The question as to *which of the methods* of disposal will be most appropriate in any case will depend not only upon the *standard required*, but upon local conditions, such as those affecting the cost of construction and the relative merits of the various types of plants, in producing an effluent of the required purity.

In conclusion, then, one may say in answer to a hypothetical question, as to what would constitute a modern and complete sewage disposal plant, adequately suited to the requirements of a small community or institution, where a high standard of purification is demanded, that it should, under ordinary conditions, and according to modern engineering practice, comprise the following general features or devices:

First. A combined screening and settling chamber of moderate capacity, provided with screens, for the removal of the coarse or grosser solids from the sewage.

Second. A settling basin or septic tank for the precipitation or transformation of a considerable portion of the organic and mineral suspended matters.

Third. A biological filter of the slow sand or rapid coarse grained type for the oxidation and nitrification of the organic matters remaining in the settled or septic sewage.

Fourth. A small settling basin, into which the effluent from the biological filters is received and sterilized, for the precipitation and destruction of the remaining suspended matters and bacteria.

With an installation of this description, properly designed and constructed, and intelligently operated, we should obtain a sterile effluent of sparkling appearance, and practically free from organic or mineral suspended matters — an effluent suitable to be discharged into any stream, without fear of destroying its æsthetic qualities or of producing a nuisance, or of transmitting disease.

THE LAWS RELATING TO THE POLLUTION OF STREAMS

By A. H. SEYMOUR, Esq.

Secretary and Deputy Commissioner, State Department of Health

The matter of the pollution of the waters of this State by the sewage from the cities and villages and wastes from manufacturing establishments is one which is rapidly beginning to assume the important place in people's minds and in the public press which it should have occupied some years ago.

The subject is one which at present occupies a large part of the time and attention of the State Department of Health and in which the health officers are interested and with which they are often called upon to deal. Not only that, but every health officer and physician as well as the intelligent body of citizens in this State are naturally interested in a topic which has such a direct bearing upon the dissemination of disease and the protection of our municipal water supplies.

I shall, therefore, speak to you briefly in a general way, as to the legal aspects of the subject of pollution from a broad standpoint. Having endeavored to make clear to you how the law has dealt with the subject in other States, I shall undertake to describe in as few words as possible what the situation is in the State of New York and how the Department is attempting to enforce our statutes in this regard.

Under the common law, which existed prior to the passage of the multitude of statutes with which every law library is burdened at the present time, certain principles regarding the pollution of streams were laid down and may be said to have been generally followed by the courts in cases of this character.

The principles of the law have been well classified, by a learned writer on this subject, under three heads: "First, the rights of riparian owners to pure water as against one another. Second, the rights of the public (as distinguished from individual owners) to have inland waters kept free from pollution by riparian owners or others. Third, the conditions under which and the extent to which public municipalities may use inland waters for

disposing of sewage matter from public sewers.”* As to the rights of riparian owners, it may be said broadly *that no riparian owner of a stream may pollute the water*, nor may he appropriate all the water, nor diminish the flow of the stream to such an extent that property below him is injured thereby. This was, I believe, firmly established under the common law and may well be said to be the law in this country, except in some of the western States, where the question of mining and of irrigation has rendered other provisions advisable. A riparian owner, of course, has the right to use the water running over his land for domestic purposes, for watering his stock, etc., but he has no right to pollute it to such an extent as to render it unfit for domestic uses by the riparian owners below him. He has no right to put sewage or filth of any kind into the water, which might render it injurious to health. A large number of cases might be cited where these principles have been sustained and where damages have been given by the courts to the injured parties. A few of the western States have partly abrogated the doctrine of riparian rights, as above stated, and have adopted what is known as the doctrine of prior appropriation. This practically supersedes the right of riparian owners and gives the appropriator the right to use the water to such an extent as may be necessary for the purposes for which he has appropriated it.

The public is concerned with the pollution of streams when such a pollution universally affects the health or materially interferes with the peace and comfort of a large and indefinite number of people in a neighborhood. Such pollution then becomes a public nuisance and when such a condition exists, it is the duty of the public authorities to cause its abatement. Only in circumstances of this kind has the public, as such, any rights in the case. In many cases the courts have held the pollution of streams to be public nuisances and I may say that the opinions of the courts in regard to matters of this kind have been generally growing broader and stronger and must of necessity continue to do so, as the population of our country increases and there are more people affected by cases of this character, and, therefore, there is a greater danger and nuisances more frequently result.

It has always been the custom in America for every city or village to discharge its sewage into the nearest stream without

* “A review of the laws forbidding pollution of inland waters in the United States,” by Edwin B. Goodell, Department of the Interior U. S. Geological Survey.

regard for the health or comfort of the people below them. It is needless for me to say that the *municipality* has no more right to injuriously pollute a body of water than has a riparian owner. They have the same rights *if* riparian owners and are subject to the same restrictions in the use and treatment of water flowing over their lands. Where a statute expressly authorizes a municipality to discharge sewage into a particular water, its authority is exercised subject to the implied condition that such discharge will not constitute a nuisance. Legislative authority can and has been conferred in a number of cases in this State to acquire the rights of riparian owners by condemnation, but it can, of course, go no further than this, as private property cannot be taken for public uses without just compensation.

Owing to the vast size of our country, the numerous bodies of water and the large and rapidly flowing streams within it, the subject of pollution by municipalities has as yet not received the same attention that it has abroad. England, many years ago, passed a "Rivers Pollution Prevention Act," the population of the country having become so large that a very serious condition of affairs was threatened. The streams of England are neither as large nor as long as our American waters, and the population is nearly ten times as dense as that of the United States. The subject was, therefore, brought forcibly to the attention of the law-making bodies of England. As a result of the passage of laws designed to check pollution, a very large number of the cities and villages in England have established and are conducting to-day sewage disposal plants, and are not allowed to discharge raw sewage into their streams. The subject has also received considerable attention in France and Germany—the city of Paris operating a sewage disposal plant to relieve the pollution of the waters of the river Seine. These countries are considerably in advance of the United States in their attitude regarding this subject. The rapid increase in population in America is forcing upon the attention of legislators and public health officials the all-importance of preserving the waters as far as possible in their original purity. We can profit by the experience of other countries and deal with this subject in the light of their wisdom.

There is no provision in the Constitution giving Congress any authority over the subject; therefore, the States in the Union exercise within their respective jurisdiction sovereign power with

respect to this subject. In my judgment, the time will come when Congress must be given some authority in matters of this kind. Take, for example, the magnificent Susquehanna with its headwaters in the State of New York, which flows across the State of Pennsylvania and into the Chesapeake bay in the State of Maryland. The increase in the population of our cities may render it necessary to use the Susquehanna as a source of potable water supply, and I have understood that it has been contemplated by the city of Baltimore. Were the States of New York and Pennsylvania to allow unlimited pollution of the Susquehanna river within their borders, we may readily conceive that its value as a source of potable water supply by cities below us and in other States might be largely destroyed or at least rendered dangerous. It is true that at present the Commissioners of Health of both New York and Pennsylvania, as a result of a joint agreement made a year ago, are working together to prevent, so far as lies in their power, any further pollution of the Susquehanna, but this is no guaranty that their policy will be carried out by the persons who may in the future be clothed with their authority. In respect to many of our larger lakes and streams it becomes an interstate question and can only be fully controlled by a body having authority over interstate subjects. Had Congress authority in a case of this kind, it could protect a body of water or stream from pollution in all the States it borders upon.

Considerable progress has been made in this country in the last fifty years in the control of pollution. Nearly all our States to-day have some restrictions with regard to pollution, and a very large number of the provisions of the different States make it a misdemeanor to pollute the waters or to discharge into them certain kinds of refuse. I shall not take the time to enumerate the States which have dealt with the subject, but I might state that, in a "Review of the laws prohibiting pollution of inland waters of the United States," published by the United States Geological Survey, the States are classified as follows: *Seventeen* have partial statute restrictions, and *twenty* have general restrictions in which the importance of pure water for potable and domestic purposes has been recognized by the Legislature. The statutes of the different States of course vary a great deal in their wording and in the restrictions which they place, and only *eight* are classified as having *severe restrictions*, which indicate that these States have adopted stringent methods

to prevent the further pollution of the streams. New York is included in this number, and the others are Connecticut, Massachusetts, Minnesota, New Hampshire, New Jersey, Pennsylvania and Vermont. Among these States Massachusetts is unquestionably far in the lead in regard to the work that has been done.

The Massachusetts State Board of Health has for many years had a large appropriation for work of this character, and the reports of their board are considered to-day to be the most valuable of any official documents issued by any State along this line. They have labored to eliminate the pollution particularly where there is danger to the water supply of a municipality, and, as a direct result, a large number of the Massachusetts cities have constructed sewage disposal plants, the operation of which is watched by the board; and they also advise the different municipalities regarding the construction of sewer systems.

The State of New Jersey proposes to carry the sewage matter from its larger cities to tidewater, a method which it is hoped will result in doing away entirely with any nuisance or danger to other municipalities. There has been, however, some criticism to the plan to empty the sewage from a proposed Passaic Valley sewer into the waters of New York harbor, on the ground that a serious pollution of the harbor would result.

Pennsylvania's new Health Department, under the control of Dr. Dixon, the distinguished physician and eminent sanitarian whom you had the pleasure of hearing last year in Syracuse, is doing a vast amount of work to protect its streams from further pollution. He has a large amount of money to work with, and will no doubt adopt and carry out a policy which will result in being of immense benefit to the State. He not only is required to approve the plans for the construction of every water system in the State or extension to the same, but he also has the authority to order the discontinuance of the discharge of sewage into the waters of the State where, in his judgment, it may become injurious to the public health.

The subject of pollution first received attention in the State of New York in 1885, when the Legislature passed a law providing that the State Board of Health might make rules and regulations for the protection from contamination of potable water supplies within this State. This law, with modification and amendments, is still in force and constitutes sections 70, 71 and 72 of the Public Health Law. Acting under this provision, the State

Department of Health has adopted rules and regulations for the sanitary protection of a large number of the potable water supplies of the State and is every year called upon to extend its authority to other places.

These rules and regulations are prepared after a careful examination of the local conditions by an expert engineer. They are then usually submitted to the local authorities for recommendations, and, after careful consideration, are made sufficient to properly safeguard the water supply, and are then published as provided by law. They then have practically the force and effect of law. Under these rules and regulations, violations may be punished and a watershed may be kept clean. The enforcement is, of course, in the hands of the local authorities, and where violations of these rules exist it is due to the negligence of the officials charged with the duty of enforcing them. This act was an important one as providing a means for protecting the water supply of a city and, acting under the authority of these rules, many cities and villages have put their watersheds in ideal condition. Those which have not enforced such rules are being called to account by the Department, and the authorities in charge of the water supply, and the people using the water will have, from time to time, the danger of neglect pointed out to them forcibly.

In 1892 an act was passed which provided that a city or incorporated village, which has made provision for the disposal of its sewage so as not to pollute or contaminate any stream, might maintain an action in the Supreme Court to prevent the discharge of sewage into any water from which it draws its water supply. There are a number of provisions in the Forest, Fish and Game Laws designed to prevent the pollution of waters to such an extent that fish are destroyed, and there is also a provision of the Penal Code prohibiting the discharge of refuse from gas factories, etc., and other noxious or poisonous substances into any of the public waters.

But the most important provision of our law was the act passed by the Legislature in 1903, constituting at present sections 75 to 79-d of the Public Health Law, as this act vests the State Commissioner of Health with most of his authority over the subject. It provides briefly that no person shall discharge any sewage into the waters of the State unless by permission of the State Commissioner of Health, and that all plans for sewer systems or for

extensions or modifications to existing sewer systems must be approved by the State Commissioner of Health, and a permit issued by him for the discharge of sewage. It prohibits the discharge of sewage from factories, etc., without permission from the State Commissioner of Health, and makes it the duty of the public health authorities of every municipality of the State to file a report and map of their sewer system as it existed at the time of the passage of the act. Under this act, when plans are submitted to the Commissioner of Health for approval, he may require the plans of a sewage disposal plant to be submitted, and may refuse to allow the discharge of sewage from such a system until a sewage disposal plant has been constructed. It, therefore, places in his hands very largely the control over *future* pollution of the streams, but the act of course could not prevent the discharge of sewage from sewer systems already in existence at the time of the passage of the act, and this presents a serious question. Unless a city or village desires to extend its sewer system, and the Commissioner of Health requires that they take immediate steps for the construction of a sewage disposal plant, the discharge of sewage from that place may be continued indefinitely unless, of course, a municipality or person below them should secure an injunction restraining them.

You are all, no doubt, aware of the attitude of the present Commissioner regarding the subject of the pollution of streams. In his first address as Commissioner, to the health officers of the State in the Conference of 1905, he called particular attention to the subjects of water supply and sewage disposal with relation to typhoid fever. He stated facts and figures to show that typhoid epidemics have been caused by sewage pollution in many of the cities, and that the only safe rule to apply was to eliminate, as far as possible, the danger of sewage pollution. He further said: "It will be the fixed policy of this Department not to grant any permits for the further pollution of our streams by sewage, except for very cogent and absolutely imperative reasons." In every official address since that time he has reiterated this policy of the Department, although pointing out that the whole subject of the pollution of the waters of the State is one which must be considered from a broad viewpoint before any drastic measures are taken.

It is alleged that many municipalities are undoubtedly discharging raw sewage into our streams when such sewage should

be treated in a disposal plant, but to demand reform in one instance, without weighing it in relation to others on the same watershed, complicates the problem rather than helps it. It is surely out of place for the citizens of one municipality to demand drastic measures against their neighbors when, at the same time, they are taking no steps themselves to correct an existing abuse. The Department has, therefore, undertaken a proper study of the questions in all their bearings, and with due relationship to all that pertains to them, and it is submitted that this is the only proper policy of a health department, although at times the progress attained may seem to be slow.

With this in mind, and with the very limited appropriation which the Department has for this work, it has undertaken during this year to make an examination of, and to carefully map, the watersheds of the State. All possible information is gathered as to the amount of pollution existing and the demands that may be made on the stream in future as a potable water supply.

After carefully weighing the subject, in all its aspects, a policy is then adopted by the Commissioner, for the Department, to govern its future actions in the granting of permits for the discharge of sewage on this watershed. As a result of this work the Department is in a position to point out positively what should be done in certain parts of the State, and with certain streams, and when plans are submitted to it for approval, it can base its refusal or grant of a permit for the discharge of sewage upon a report which has been given after careful study and a policy which has been fixed after thorough investigation.

I do not believe I am going too far to say that this work should have been done years ago. Had the State had such a policy ten years ago a large amount of the pollution would already have been eliminated. The criticism for not doing this, if any there be, must be upon the Legislature which has failed to provide any funds for the work. The fact that the Department has undertaken this work has brought about one of the natural results which follow any particular line of activity, and that is that constant demands are made upon it to undertake work which it cannot do, and to attempt to remedy conditions with which it has no legal authority to interfere. Enthusiastic, but ignorant, citizens of the State interested in the subject of pollution, whose ideas seem to be that the Commissioner of Health has absolute authority to do anything that he may take a notion to, are con-

stantly writing the Department demanding that he issue orders where he has not a shadow of authority, and that he remedy private wrongs which belong in the civil courts; and one recent communication stated that the people of a certain village were suffering with malarial fever, and asked that the Commissioner of Health issue an order to relieve them. In many of the cases presented it would be just as feasible for the Commissioner to issue an order that on and after a certain date there should be no more smallpox in the State, but in every case where the Department apparently has any authority, or where its advice would be of any assistance, it does and will go as far as its limited means will permit and make such an investigation and such recommendations, or lend such other assistance as is in its power.

Some of the newspapers, with that characteristic inaccuracy and misrepresentation which a few of them so carefully follow in all their comments respecting public officials and public authority generally, have seen fit to criticize the Department for not immediately bringing about an end to the existing conditions in this State regarding the pollution of streams. I am willing to submit to you, gentlemen, as health officers of the State — as the real backbone of the Department of Health — whether the attitude of the Department on this question is correct, and whether its policy is sound. You are frequently called upon to express an opinion in matters of this kind and also to inspect complaints with regard to pollution. I believe it to be a part of your duties, not only as health officers, but as the leading sanitarians of your respective jurisdictions, to discuss these matters when they are brought up, and to assist in educating your people to the importance and necessity of the preservation of our lakes and streams from pollution, not only as a health measure, but also that future lovers of nature may enjoy our streams as they should be able to. Were this indiscriminate pollution to continue, our fishing, boating and bathing, so dear to every lover of out-of-door life, will be a thing of the past.

The discharge of wastes from mills, particularly pulp mills, dye works, tanneries, etc., presents at once an interesting and a somewhat complex question. Under our law every mill or factory owner must secure permission from the State Commissioner of Health to discharge refuse or waste matter into the waters of the State. In issuing these permits the Department endeavors to restrict the pollution wherever possible, and it issues no per-

mits, except with conditions attached, which permit is revocable at any time. This course is also followed in issuing permits for the discharge of raw sewage from public sewer systems, the effluent from sewage disposal plants, etc., and in this way the operation of these plants is kept under the supervision of the Department to a large extent.

The law further provides that the local board of health shall make and maintain such inspection as will at all times enable it to determine whether the act is complied with in respect to the discharge of sewage, refuse matter from mills, etc., into the waters of the State. Upon discovery of violations of the act it becomes the duty of the local board of health to serve a written notice on the person or corporation responsible for the violation, specifying the violation and fixing the time within which it must cease. If at the expiration of this time the violation continues it is the duty of the local board to report the same to the State Commissioner of Health, who shall give a hearing and take proof of the facts, and if he finds the violation to continue he shall certify that fact to the Board of Health, which shall then bring an action for recovery of the heavy penalties imposed and for an injunction. The penalties for the discharge of sewage from a public sewer system without a permit is \$500 and \$50 per day for each day the offense is maintained. The penalty for the discharge of sewage from factories without a permit is \$100 and \$10 per day for each day the offense is maintained.

Local boards of health should see that these provisions of the law are fully enforced. If sewers are being built in your city or village, by individuals or by public authority, see if the plans have been properly approved by the Department. If factories are constructed, which wish to discharge sewage into the waters of the State, see that they have permits, or stop the work. Whenever possible require the construction of settling tanks in factories, if they use dyes or colors, before permitting them to discharge into your sewer systems, and save complaints on this score.

In other words, do what you can to prevent the further pollution of the waters in your vicinity, and you may be sure that if occasionally you meet some chronic faultfinder who thinks your work unnecessary, that at least future generations will rise up and call you blessed.

Now, just a word as to the future of this problem in New York State. It may be said that all public health legislation is

progressive legislation. It took twenty years to secure the passage of the Pure Food Law by Congress, and the progress of legislation along sanitary lines is usually slow, but it may safely be said that, having once committed itself to a policy along an indicated line necessary in the preservation of the public health, the State cannot and will not recede from its position. It is, therefore, only fair to assume that the laws of this State regarding the pollution of streams will not be modified. They may be changed, and probably will be, but the general trend of legislation will be to make them more stringent and to erect more safeguards against the pollution of our waters which will be so badly needed by future generations for potable water supplies, and for the purposes of pleasure and recreation.

I predict that within our lifetime, and certainly within the lifetime of the next generation, such absolute restrictions will be placed by law that there will be no further pollution of our waters to any great extent, but that the cities and villages will be required to construct and operate efficient sewage disposal plants, and that a municipality which proposes to discharge its raw sewage into a stream will be regarded as barbarous.

In the interests of the health of the citizens of this State the State Department of Health proposes to do everything in its power to further the time when such elimination of waste matters will come, and you health officers can do a great service in using your influence with the Legislature to secure adequate appropriations to carry on the work.

It is not a work which can be easily carried to a conclusion, or which should be done too hastily. Sanitary science is progressing by leaps and bounds, but there are still many puzzling questions before us. For instance, the pulp mills in parts of our State have badly polluted some magnificent streams. The question now is, What can be done with pulp mill wastes? and sanitary engineers seem at a loss for a positive answer.

While the mill owners are entitled to consideration, and property rights should not be disturbed without careful study of the questions involved, I feel that property rights should not be given paramount consideration to those of the people. For one, I would be glad to see the pulp mill banished forever from the Adirondacks. Give us back our beautiful streams and forests in their original grandeur, and make these industries seek other fields of action or cease ruining our magnificent play grounds and health resorts.

No subject presents more alluring aspects to officials in public health work than this great question of pollution, and in almost none can he labor with more gratifying satisfaction in the knowledge that he is working, not only for the increase of comfort, health and pleasure of the present generation, but also of those still unborn, whose appreciation of the beauties of mountain, lake and streams will be as deep as our own, and when this mighty State — the greatest in our Union — harbors the immense population it is bound to have, and our water supplies are drawn on to the utmost for the very source of health itself, pure water, will future officials, charged with the responsibility of enforcement of public health laws, stand before audiences and give due credit to those who labored in the past in this great work.

SANITARY INSPECTION OF WELLS AND THEIR SURROUNDINGS

BY MR L. M. WACHTER

Sanitary Chemist, State Hygienic Laboratory

In considering the source of typhoid infection, causing the sporadic cases occurring in our smaller communities, it often seems as though it was taking the course of least resistance to accuse the well.

The other possibilities should first be eliminated, such as the absence of the patient from home ten to twenty-five days prior to the onset of the disease, the eating of raw vegetables or shell-fish, the drinking of milk produced at another place or handled by some one sick or convalescent from a disease that might have been typhoid.

The persistent presence of the typhoid bacillus for long periods of time in some people, who have had the disease, awakens us to possibilities of infection from sources unthought of in the past.

For a well to become infected we must, of course, first have the infecting material, and, secondly, we must have a mode of transmission to the water in the well.

Naturally we at first think of the privy as the source from which the infection is transmitted to the well. This necessitates the supposition of a previous case or a bacilli-carrier depositing discharges into the privy; and, if such discharges are deposited, it is quite as probable that flies are the mode of transmission, for they often carry the infection greater distances than the area drained by a given well. Or they can infect food that may afterward be carried into the home and used.

Our attention is frequently called to instances where there are several cases in one family or on the same premises. Of course it is quite possible that the different cases could have been contracted by drinking the water from the same well; but, if a period for incubation elapses between the first and other cases, it is more probable that there is secondary infection by direct contact or transmission by the mixing of duties, the nursing and the cooking, for example.

The possibilities of infecting the well can be rendered more remote by the generous use of chloride of lime around and in the vault that may have received infected material before the physician had been called, and the proper disposal of the patient's discharges by disinfection, and burial will reduce this danger to the minimum.

And now let us consider some of the possibilities of polluting wells. The first and greatest possibilities are at the surface. If we will stop a moment and consider the condition of many wells at the surface of the ground we shall readily realize this. If the well is dug, the walls are generally far from water-tight, and usually extend but little above the general surface of the ground and are covered with a leaky platform. Safety and cleanliness would require that at least the upper four feet of the wall be made of concrete or other water-tight material, and that this wall extend a foot or more above the general surface, thus excluding surface wash and seepage.

In the case of a driven well, care should be taken that there is no seepage along the outside of the pipe that can find its way downward toward the water that is supplied from the well.

Surface pollution, though it may not be the means of infecting a well with pathogenic organisms, renders an analysis of the water almost useless and for the following reason:

In routine work the analyst does not attempt to isolate the typhoid bacillus, but makes tests for bacilli of the *B. coli* type. This species naturally inhabits the intestinal tract; unfortunately not only of man, but also of warm-blooded animals, and here lies the difficulty of interpreting results. One can only say that the water is polluted with matter of fecal origin. This is not necessarily of human origin, and hence need not of necessity be accompanied by typhoid bacilli. If the polluting material reaches the well as surface drainage, it quite likely originates from stable filth. With these possibilities of surface pollution, filthy but not necessarily dangerous, to obscure the results, you can readily see the difficulty of making a correct diagnosis.

The analyst makes mistakes as well as the physician, but ours remain recorded on paper to be flaunted at us in the future, while yours are possibly buried. These mistakes are usually caused by the absence of definite information regarding local conditions.

Frequently we get samples of well water, the chemical analysis of which indicates that the water has been heavily polluted in

its past history, but that soil filtration has corrected it. The bacterial analysis of the same water shows that organisms of fecal origin are still present, but this does not tell us if they are from accidental surface pollution or if they are relics of the past pollution not completely eliminated by the soil filtration, and consequently have reached the well by subsurface drainage.

Let us next take up the possibilities of subsurface pollution of wells and the principal factors that make this pollution possible or aid in its prevention.

The first and most evident factor is the distance that the sources of possible pollution are from the well. The second is the character of the soil or rock intervening between the well and the sources of pollution.

This latter is the more important factor because upon this depends the rate of the movement of the underground water from the source of pollution to the well.

Shale rock, limestone and some other formations are the most undesirable materials, because the water finds its way through fissures and flows at rapid rates, without giving sufficient opportunity for purification by soil filtration. The more compact the soil the less the danger from pollution, because the motion of the underground water is retarded and the slow movement gives opportunities for the necessary purification.

Dr. Thresh, a recognized British authority, in a paper read before the British Association of Water Works Engineers, stated:

“The author is anxiously looking out for the records of any outbreak in which the contaminating matter had to percolate through several feet of compact soil before it reached the incriminated water, but as yet has been unable to find any such record.

“There are many reports on single cases attributed to the use of shallow well water. But in nearly every instance it is stated that sewage could practically run directly into the well, and in the cases where there is no record of the condition of the well or of its immediate surroundings, such defects may have existed and failed to be recorded.

“In very many of these small outbreaks, however, the proof that the disease was due to polluted water is of a most unconvincing character.

“The author has had a great deal of experience in connection with outbreaks of typhoid fever, and has made an especial study of the sporadic cases which occur from time to time in nearly all districts, but has never investigated a single case in which the

well water was seriously liable to the suspicion of being the cause, where the well was so placed or constructed that sewage had not more or less direct access.

"He is driven to the conclusion that water, in slowly percolating through a few feet of compact soil, cannot carry with it the microbe causing typhoid fever. Where water takes days to traverse the subsoil before reaching the well or spring, the typhoid bacillus is either filtered out or loses its life.

"Both filtration and time are undoubtedly important factors in water purification by the action of the soil.

"The more readily and directly the polluting matter can reach the water, the greater the danger, the longer the period which elapses between the polluting matter being deposited on or in the soil and reaching the subsoil water, and the more compact the pervious soil, the smaller the danger.

"Water derived from compact subsoil can, therefore, be readily rendered perfectly safe by the proper construction of the collecting well and by adequate protection of a limited area around the same.

"Where the subsoil is fissured, as occurs in very many formations, unless the fissures are filled with deposits from a more superficial stratum, the risk of pollution of a dangerous character is much more serious. Even if the well is of a great depth or is far from any possible source of pollution, it must be remembered that if pollution gets into an open fissure leading to the well, serious results may follow, even if the contaminating material has to travel a long distance before it reaches the well.

"Here time may be a factor.

"The typhoid and cholera bacilli can only live for a limited time in water; and if these bacilli gain access to the water in these fissures, yet do not reach the well until after a lapse of several days, it is very probable that they have died before entering the well, and will, therefore, be no longer a source of danger.

"Unfortunately, however, circumstances may arise greatly accelerating the rate of flow in the fissures—such as increased pumping, heavy rainfalls, or both—and although under normal conditions the well may be a safe source of supply, under the exceptional conditions it may be a dangerous source."*

Summed up, Dr. Thresh's contentions resolve themselves principally into the element of time. The greatest danger comes from surface pollution because the pathogenic organisms reach the well directly with no length of time intervening to allow

* *Engineering News*, Vol. 58, No. 5, page 109.

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antagonizing forces to cause their death. Next in point of danger come fissures in rocks, because they make it possible for the infecting material to quickly enter the well, again preventing time to elapse, the big factor in the fate of the typhoid organism in water.

Lastly, compact soil is safe because the water must travel slowly and the typhoid organisms are excluded or die before reaching the well.

Many people have an idea that the more water that is pumped from a well the better the water. This is a fallacy; pure water does not become stagnant, and much pumping lowers the ground water level near the well, and this would increase the rate of flow toward the well and so increases the danger of infection.

This brings up another point, the possibility of infection remaining in a well for years after it was once infected. This is probably not so. If the source of infection is definitely known and removed, and the site thoroughly disinfected with chloride of lime, there seems no reason that the infection in a well should persist for a year or longer.

Our inferences are that causes other than infected wells are more frequently the cause of sporadic cases. Even when a privy has received infected material, flies are quite frequently the medium of transmission and not well water alone, as is generally supposed.

More attention should be paid to the construction of wells at the surface of the ground and the platforms covering them, to make them water-tight and prevent surface pollution, as this is the easiest avenue of access. Wells in rocks containing fissures are particularly dangerous, while compact soil renders the possibility of pollution remote.

When there are opportunities for pollution from barnyard drainage, either at the surface or by percolation, the routine bacteriological water analysis cannot differentiate between fecal pollution from this source and that of human origin which might carry the typhoid bacillus.

If you eliminate the other possibilities as to the probable source of infection, and then wish to have a well examined, send for an outfit from the Department and fill out the circular describing the well and its surroundings, the character of the soil or rocks penetrated, the distances and relative positions of the different factors and any such information that will assist the analyst in

forming a mental picture of the physical condition of the well and its environment.

Physicians cannot diagnose disease by telephone, unless they are practitioners of the absent treatment, nor can the analyst interpret the results correctly by intuition. You help yourselves by making it possible for us to give correct interpretations.

FRIDAY, OCTOBER 18, 1907

FOURTH SESSION, 9:30 A. M.

PRACTICAL POINTS ON QUARANTINE

BY JOHN T. WHEELER, M.D.

Director Division of Communicable Diseases, State Department of Health

Most of us know Dr. Goler of pure milk fame. Those of us who do not know him and who hear him this evening will feel that they do know him. Not all of us know, perhaps, that he is an expert in the first rank on eruptive diseases and particularly in smallpox. I was talking with him some six months ago in Rochester about differentiation between chicken-pox in the adult and smallpox, and the stumbling block it was causing in a good many places in this State to the great discomfort of the profession and injury to the public. About three or four months after that, when I was in my home about 300 miles from Rochester, I was called up on the telephone and the call was from Rochester. The voice was that of Dr. Goler, and this was the message: "I found a case of chicken-pox in the adult." And surely enough after he sent me the photographs of it I agreed that it was a case of chicken-pox in the adult. I would like to have examined this case, as the probabilities are that it is the first case of chicken-pox in the adult I have ever seen, and I hope it will be the last one.

I want to give you the real and practical workings really suited to these conditions for a differentiation between chicken-pox in the adult, and smallpox. There are no doubt those in the audience and many men throughout the State who would give good money if they had known them really before and had a chance to learn this conundrum. It has caused them a great deal of humiliation; caused the State a great deal of expense and started a great many epidemics of smallpox.

Whenever you get a case of an eruptive disease in the adult, and you can figure the diagnosis down so that it stands between chicken-pox on the one hand and smallpox on the other, call it smallpox and you will be right every time. I will go further

than that. If you can carry your diagnosis further, if you can throw out smallpox altogether so that you have only chicken-pox and nothing else, still call it smallpox and you will be pretty nearly right. Also, say that chicken-pox occurs about once a year; well, Dr. Goler has cornered up our one case for this year and we will be safe to call all the rest smallpox.

The Department is rather sore over the way smallpox has been mistaken for chicken-pox in so many places during the past year and allowed to go on and spread until it becomes quite difficult to manage. This poor, mongrel, weak, diluted smallpox, that is smallpox, and that isn't anything else but smallpox, that is breaking out, from the concealing characteristics of the disease, misleads us into thinking that it is only chicken-pox.

Along with the photographs I send around a report of one of these doubtful cases by Dr. Curtis, the dermatologist, and the President of the Medical Society of the State of New York. He is a man whom we must acknowledge as master on all questions concerning the exanthemata. You should read the report carefully as it goes with the photographs, and is in itself an exquisite pen picture of a case of disease, and a fine illustration of diagnostic acumen and poise of judgment. You will see that the doctor kept the case under observation for three or four weeks before he called it smallpox, but observe, moreover, that he had been treating it as smallpox all the while.

When I left Albany there were twenty different places in the State where the disease had been recently reported. Its universal mildness robs it of its traditional horror, and accounts largely for its reckless diffusion by the laity, and accounts also for the difficulty in diagnosis. It is atypical, and misleads men who are looking for the old-fashioned form — both the young doctors who have never had any opportunity to see any smallpox at all, and the old hands who think they know all about it.

But it has held sway for some years now; its characteristics are pretty well defined; and there is no excuse for the profession, and for us who are distinctly sanitarians, to keep on blundering about it. It is smallpox and nothing else. We do not know how soon the type will change; we know that epidemics of widely varying severity have, in times past, followed one another in rapid succession. Human experience does not justify us in treating the disease other than traditionally. The public who know no better may be justified in regarding it with light-minded indifference,

and make us a world of trouble in holding them in control; but we who have the history and experience and the training of our profession must not allow ourselves to be misled.

Let me go over something that was printed in the Bulletin six years ago or more. I think that Dr. Curtis must have written it. It is in regard to the differentiation of diagnosis. Note these data to aid you in the diagnosis:

“If an adult: If the initial fever is marked and lasts three days, subsiding as the eruption appears; if the eruption comes first on the face and is the more abundant there; and if there is any induration of the lesion, as of a papule having become vesicular, all of these or any modification of them are quite conclusive of smallpox. No adult should be allowed to be at large with an eruption thought to be that of chicken-pox; no case of vesicular exanthem, proceeded by marked fever, though the fever may have no characteristics differing from that of a severe or mild cold; no vesicular eruption so starting and coming mostly on the face, wrists (and frequently on the palms) is likely to be anything but smallpox; and if there is any induration of the base of vesicular lesions appreciable to touch with the tip of the finger, all of these are to be held as conclusive symptoms. In every case, give the benefit of doubt to the public, for there will be some cases in which diagnosis will, for a little time, be difficult. Where several cases have occurred the difficulties of diagnosis will be lessened.”

That is if there is only one case in the family it may be difficult to diagnose it; but where there are two or more you get a good chance to watch it better.

There are several special points that I want to talk to you about as health officers, that should be of very great interest to you. The one point I want to take up now is, that of the individual report card in cases of communicable diseases, and the significance of this card. We want to be an organization with one object—force of united action and unity. In behalf of the Department I want to thank the very large number of health officers, and the still larger number of physicians who are not health officers, for the thorough way they have sent in their report cards of contagious diseases.

These individual reports are the foundation of the science of epidemiology, the science of the laws which govern widespread diseases.

It takes a little time, it does not signify much to you when you send it; but in the Department as your cards and your neighbor's come in together, collectively they tell the story of the outbreaks of disease.

You may not know that your neighbor up the stream had typhoid before you did, but it is on the cards; and we trace it back up the stream, through one village and another for many miles; perhaps, to its very source on some hillside farm; and your town ultimately gets the benefit of the knowledge. Or, again, from your own observation, you suspect some valuable water supply—which is on many accounts a serious matter. But the broader study of the facts permit us to say, "no," the fever comes from individual carriers, or from flies, and it is a great comfort to find that your costly and trusted water sources are still unpolluted, and the epidemic an easy one to manage.

Last winter the report cards told Boston that a surprisingly large outbreak of scarlet fever had suddenly appeared in one of the city suburbs. There is only one interpretation for such a sudden and violent outbreak. It means milk; and they forthwith traced it down to the very milk handler who furnished the contagion for the entire epidemic, and the epidemic went down as rapidly as it had flashed up, for when they suppressed him they suppressed the entire epidemic.

Several weeks ago we apprised every health officer in Jefferson county that smallpox was coming; a gentleman full of smallpox and whiskey had broken quarantine and was wandering up and down the county. Last summer a negro got loose on the west bank of the Hudson with smallpox, and telegraph communication came to us two days later from Philadelphia reporting that they had him fast in the pesthouse of that city.

See, what a study I have been able to make from the diphtheria records of one town.

In so far as we act together in this way, we are an organism capable of highly developed functions for the good of the whole body politic, but without this vital connection of the report card between the health officer at the periphery and the Department at the center we would be a lifeless aggregation of unrelated parts, of little value to the public.

If we begin this crusade against diphtheria, the report cards will be of inestimable importance. The crusade against tuberculosis is just beginning to take form. Here again it will be

the information from the report card which will furnish the basis of operations.

If you want to do something for the good of humanity, and have not done it already, send us in next year a card report of every case of contagious disease in your municipality. Make the cards in duplicate, and file one away in your card index for reference.

DIPHTHERIA

There are those of us who believe that in respect to the sanitary control of diphtheria through the use of free antitoxin, that the State is not achieving quite all the results that it should. You know that diphtheria is third among the contagious diseases in respect to mortality. It records over 3,000 deaths per year, about double the mortality from typhoid fever. Now the report which comes in to us through the agency of the individual report cards show that we are not making the most of our blessings. The gift of antitoxin has wrought such an amazing change in the mortality of this dreadful scourge that we have been content to accept the gift blindly without stopping to consider how we can use it to the very last extreme of its very beneficent possibilities. Because science has put into our hands a most powerful weapon, even when used clumsily, it looks as though we had never taken the pains to handle it with skill.

There are three ways of wasting antitoxin: One is, to not use it at all when it is at hand and needed. The second is to use it in too small quantities. And the third is to use it in excess of its needs. But as you never know how much toxin there may be at work in the system in any given case, you can never know when you are giving too much of its antidote, and it does not at all matter, because the excess can do no harm. So the last way of wasting it can be left out of account.

I believe that by the organized action of this body of men sitting before me, the annual death rate of diphtheria can be reduced 50 per cent.

That means that we — we men in this room — by our united efforts, by our intelligent scientific use of diphtheria antitoxin among the poor, can save enough lives, to almost, if not quite, offset the entire mortality from typhoid fever through the entire State. If antitoxin were free to all classes, the better-to-do as well as the poor, I know we could. I want to enlist this morning

an army of crusaders pledged to the mission of knocking out diphtheria in one round. I mean stamping out an epidemic with the first case. We can do this among the poor only, for they are under control; among other classes of society, the cost of the remedy is so great that they neither use it to the best advantage for themselves or for the public at large. It is an anomalous situation, if you happen to think of it — the poor being better off than the rich, but it is true in this instance. The use of antitoxin in our hands, including as it does, not only its use for the cure of the individual but its sanitary use for the suppression of the epidemic — and the use of the agent pushed with a purpose to the last limit of its curative and sanitary powers, is a pretty important matter. We need to have a good understanding and to lay down certain rules.

(1) Antitoxin must be used in every case of diphtheria. No man is wise enough to foresee a nonfatal issue; but even if we all were, it is not enough that the individual survive. We must arrest the destructive action of the toxin on the cells of the body, which may be very grave in its results even though it stops short of death. Antitoxin does good to every case. It must be used in every case for another reason. It is the shortest and most certain way to get rid of the center of contagion.

(2) Antitoxin must be used at the very earliest possible moment, upon the merest suspicion of the presence of diphtheria, without waiting for a positive diagnosis, either clinical or bacteriological. Rule 2 is imperative. We must act thus promptly because the destructive toxic action advances rapidly, and each twenty-four hours is marked by an alarming increase in the fatality. Delays mean more deaths, more and graver sequelæ. And again, the longer a case is allowed to run, the greater the public risk. This rule will include a particularly dangerous class of cases to the community which are quite commonly overlooked, viz., cases of apparently simple pharyngitis occurring during the diphtheria epidemic. If left untreated, they are a prolific source of infection. Of course under this rule we will often give the serum when it proves later we did not need to do so.

(3) The injections should be repeated every twenty-four hours until an effect is obtained.

(4) Antitoxin must be used in doses so large that they err, if at all, on the side of excess. We do not know how large the quantity of toxin is at work in the system. Sometimes from its overwhelming violence we know that it must be very large. We

should never fail to give enough to neutralize the poison. If we give more than enough we have done no harm.

(5) Finally, antitoxin must be used for immunizing purposes on every exposed person. Antitoxin does not destroy the Klebs-Loeffler bacillus, it is true, and immunized persons may still be carriers of the disease, in their healthy throats; nevertheless, it is the most effectual way known of hedging round the disease. As a rule, every member of the household should be regarded as an exposed person, and a careful inquiry instituted for exposed playmates, next door visitors, particularly servants, etc.

Now, let us put these rules forward for what we may call our ideal treatment of diphtheria, and just to convince you that there is justification for expecting a great improvement if we all pull together, let me give you a specimen of the real actual practice of the last year. I hold in my hand a bunch of report cards. They tell the story of an epidemic in one of our Hudson river towns, no different in any way from twenty others in as many other points in the State. The health officer of this town is a good man; the physicians are quite up to the average. It is an illustrative case.

CHRISTIAN SCIENTISTS

We are liable every now and then to run up against the Christian Scientist, and when it comes to a matter of quarantine, the Christian Scientist with his peculiarities of "beliefs" about smallpox and diphtheria and so on is a hard proposition.

It is just as well to be well prepared in advance when we do encounter them, so we shall have command of the situation. With their beliefs on religion and disease, we have nothing to do except in so far as the latter interfere with the public safety.

Doctors are apt to be a little bit intolerant. It is Mr. Dooley who remarks: "If the Christian Scientist had a little more science, Hinnesey, and the doctors had a little more Christianity, I think with the aid of a good nurse, Hinnesey, a man might get along pretty well."

We will take up a specific case and discuss it:

LETTER FROM A HEALTH OFFICER

EUGENE H. PORTER, M. D., *State Commissioner of Health*:

Dear Doctor:—Herewith I hand you report of cases of diphtheria occurring in Christian Science families in our town as per request of your Department.

Monday, July 8, 1907. People in vicinity reported two cases of sore throat in family of Mr. Blank (Christian Scientist). I immediately investigated and made a diagnosis of diphtheria; quarantined the house and offered to procure medical aid and give antitoxin. Offer refused. They requested that I allow their healer to pass in and out and treat the cases, which I refused to do. In the meantime the report reaches me that healer had been in and out twice during the day. Investigation proved the report true. Was unable to locate healer. Stationed an officer at house instructing him, if healer went in to keep him within and allow no others to pass in or out. At 7 or 8 o'clock healer went in and is still there. Patients, two girls, one 24 years; one about 10 years. Tuesday or Wednesday, July 9 or 10, mother, Mrs. Blank, became infected and died Sunday, July 14, 1907.

I went to the house, ordered a private funeral and reported case to the coroner who viewed the remains and issued death certificate. Tried to persuade the family again to have physician and to have antitoxin. They refused. Monday, July 15, daughter, 24 years, died. Coroner again looked after the case. Funerals and burials under my supervision July 15, 9:30 a. m. House fumigated. Other patient improving. Up.

Remaining in the house are, one child of 7 years; the father, a man aged 45 to 50 years and healer, man of 45 years, none of which have had the disease and two older girls who have probably recovered sufficiently to be out of danger.

Medical treatment refused as treatment or prevention again to-day. I intend after strict fumigation to keep strict quarantine until period of incubation has passed.

Kindly advise me as to period and if you deem advisable any other points for me to observe. Respectfully submitted.

The following day the Doctor adds: To-day after discussing the matter with you, I went once more to the residence of these people and requested them to allow me to use antitoxin on the seven-year-old child. After a time, permission was granted, and I gave immunizing doses.

CHRISTIAN SCIENCE

There are some interesting questions involved.

The Christian Scientist undertook at first to let epidemic diphtheria run its natural course without reporting it, or without either medical assistance or antitoxin or quarantine.

Later, he accepts a quarantine but tries to evade it as regards the healer, and refuses antitoxin or other treatment. Two children, one a victim of the disease, and one well, are minors.

What ought to be done in behalf of those two minor children exposed on account of their father's belief to the fate of the mother and older sister?

On this point the law is very explicit: Section 288 of the Penal Code provides, that a person who wilfully omits, without lawful excuse, to perform a duty by law imposed upon him to furnish food, clothing, shelter or medical attendance to a minor, is guilty of a misdemeanor. Furthermore, the violation of the quarantine regulation in letting the healer pass in and out was a misdemeanor. So, too, the healer was a violator of the law in entering the quarantined premises.

But suppose there were no minors involved. Has any one the right, out of deference to a religious belief, to ask to allow so difficult a disease as diphtheria is to control, to run through its natural history with no other protection for the public than a police quarantine of a private residence on a public street. It means an undue prolongation of a center of contagion, and an uncertain degree of isolation. It is certainly a question which a local board would be justified in entertaining, and in acting upon, for the public protection. Any action of a reasonable character looking to that end would be pretty likely to stand.

In this case the intimation of an arrest seems to have been enough. The Christian Scientist could accept the alternative of death for his wife and child, but the alternative of jail was quite too much for himself.

It appears that the law, therefore, does not leave helpless in dealing with these curious religious fanatics, but while we must protect the public against them, and likewise their defenseless minor children, we should take care not to give the impression that we are inspired by a spirit of religious intolerance.

ANTIVACCINATIONISTS

Next after the religious fanatic comes the antivaccinationist crank. He is, as a rule, a personality of small account, but I bring him in for the sake of advising you first, not to take him too seriously, and secondly not to let him interfere too much with the enforcement of the school vaccination requirements. Generally, he is a man who has heard of some one else who has had trouble with vaccination, whose mind lacks scientific training, and who is ignorant of, or who refuses to see in their true perspective the trivialities of vaccination in contrast with the enormi-

ties of smallpox. It is a fad for some kinds of fakirs. Just now, there are some to be found among the callow youths who delight to read the Philistine. Here is a specimen from the principal of an academy. We have several letters from principals of academies:

Mr. Commissioner:— I hope the Department will agitate the question of free antitoxin until it is an accomplished fact. Further, I hope that physicians using it for the first time (and there are many who would be in that class) should receive sufficient instruction relative to its proper administration.

There is much antagonism to vaccination, and I would be glad to receive literature bearing on the subject. I have given the matter quite a little study lately, for I have seen much harm done in its practice, and wish to know more concerning it before I advocate its compulsory practice. Thanking you for any favors, I am,

Yours truly,

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To which was responded:

My Dear Sir:— In reply to your communication of August 29, this Department does not furnish controversial literature upon the subject of vaccination for the reason that the proportion of intelligent people who think they are antivaccinationists is so small, that they are a negligible quantity. They are mostly harmless poseurs who do not resist the law, and who, when the actual pestilence of smallpox comes, go and get vaccinated like the rest of us. For a layman who is sincere however, the advice of a physician of experience and good judgment is just as valuable in this as in any other professional matter. You are fortunate in having such a one in Dr. R. of your town. I advise you to consult him.

The Acute Contagious Diseases, Welsh and Chamberg, Lea Bros. & Co., is the best recent authority on smallpox and vaccination, if you wish to read at all, and Elbert Hubbard in the Philistine is a good specimen of the untrustworthy poseur class.

Very sincerely, etc.,

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COMPULSORY VACCINATION

I bring these letters up to insist that you shall not let these gentlemen interfere too much with the law regarding the vac-

cination of school children. These gentlemen play the role of martyrs over what they call compulsory vaccination. There is no law in this State actually compelling anybody to be vaccinated against his will, but the law attains the end in an indirect way. It prohibits the unvaccinated child from attending school. It is a law mandatory on the school trustees, but there is no penalty for its nonenforcement and, consequently, is much neglected. It is the duty of a local board of health to take into account a situation like this and to deal with it. The procedure would be something like this: The local board of health would formally call the attention of the school to their neglect to comply with the law, state that the protection of the public against smallpox at this time demanded its compliance, and call upon them to take action before a certain date. Now, if the health board is one which commands respect this notice will commonly suffice, but if for that or some other reason the trustees hold back, the health authorities must proceed to make good. They have at least two courses open before them. If the situation is critical, that is, if smallpox is in town or near by the health board may order the school closed. It should at the same time notify the Education Department that the school has been closed, giving the reason, that the school, by reason of neglect of vaccination, was a source of danger to the community. This will put the school trustees into difficulties with both the public and the State Department, and will pretty certainly bring them to time.

But it may be that the local situations will hardly warrant closing the school. In this event the health board may enforce the performance of the duty by a mandamus. There is no reason why a board should not carry its point, if it sets out. It is brought forward as an inconsistency that a child should be excluded from school under this law, and punished for staying out under the Truancy Law, but make sure that your organization is perfect, that every formality is carefully observed so that if you are going into a contest you can be sure of yourself. The law is thoroughly constitutional and there is no reason why it should not be enforced.

THE MANURE HEAP IN THE LITTLE TOWN

Here is a letter from Fultonville concerning a matter of not so momentous importance as some we have dealt with this week, and yet has a very direct and human appeal. It is written in a fine,

trembling hand by the clerk of the board. I fancy he is a very nice old gentleman whom we would all like to know. He writes:

To the Officers of the State Board of Health:

Dear Sirs:—There is no contagious disease at the present time. We have had three mild cases of scarlet fever this year. They all recovered. On account of there being no sewer system, we have some trouble in getting closets, and cesspools, cleaned or moved when complained of. We have a case on hand at the present time that seems difficult for us to decide.

At the rear of a hotel is a sort of a court yard about 100 feet square. There are three stables, each one having a huge heap of horse manure that has not been cleared away this year. A saloon-keeper adjoining this stable, who maintains no stable, complained to the Board, claiming the smell from those heaps to be offensive to him. Notices have been served on the parties, but they have been disregarded.

Although not being a menace to public health, it seems to us to be an offense against public decency. It has two driveways leading to it and can be seen from the street. The parties defy us, claiming the right to maintain them. The hotel-keeper allowed slaughtering in his barn until we stopped him, and it is claimed that he has offal buried in his manure pile which he refuses to remove.

What I wish to know is whether we have any authority in the matter, or is it a matter for the village trustee?

Hoping to hear from you and get your opinion in regard to it, I remain,

Yours respectfully,

THOMAS M. FOODY,
Secretary of the Local Board

P. S.—This is a question whether or not manure heaps can be deemed a nuisance in an incorporated village, a few feet from the main street.

To which there was this response:

July 25, 1907

MR. THOMAS M. FOODY, *Secretary Board of Health, Fultonville, N. Y.:*

Dear Sir:—In reply to your inquiry of July 24th, notwithstanding that there is no contagious disease in Fultonville, a year-old manure heap in the center of the village and near a public street is a potential source of disease.

With what we now know of flies, common flies, as carriers of disease, any breeding place of these insects is a nuisance, and should be forthwith removed.

Any health board which fails to enforce a regulation removing such a nuisance, will fail of its duty to the community, and any community which fails to support its health officials in an undertaking of this kind must be singularly lacking in public spirit. Go ahead. You have the power and the machinery. Act in due conformity to law, but act. If you make mistake, you will not be personally liable.

Very respectfully,

EUGENE H. PORTER, M. D.

The manure heap in the little town has always been a disreputable nuisance, but with the increase of dignity which now attached to the common fly as a carrier of disease, the birthplace of the insect becomes an object of interest.

Fultonville, with its three cases of scarlet fever, all mild, for its record up to August, is to be congratulated, but a case of typhoid fever or of dysentery in that hotel which insists on "maintaining" its manure heap might sadly spoil the record.

Fultonville has another lesson for us of very general application. That is the small amount of efficiency a health board has without a healthy public sentiment behind it, and the very large powers a board will find itself to possess when once it makes up its mind to exercise them.

PERMANENT IMMUNITY FROM SMALLPOX

I come back to one subject which is very commonplace, and about which nothing new can be said, and yet it is one of an importance which has always been immense and which is equally so now.

Don't let the present mild epidemic of smallpox switch you off from the track that the great preponderance of the population must be kept immune from smallpox by vaccination, so as to have ever present, when the old-fashioned, severe smallpox comes, a barrier of immunity so broad and so high that we may laugh the pestilence to scorn.

It does us all good once in a while, lest we forget, to recall enough of the history of smallpox to appreciate its immense significance in the era before vaccination, and the exactly coequal

importance of vaccination from that day to this, and from this day on through all time, so far as we can foresee.

Think of smallpox in that eighteenth century. The most terrible of all the ministers of death, as Macauley called it; a universal disease, in every land and every clime; a perpetual disease; epidemic every three to five years — as often as enough children should accumulate to furnish fuel for the fire. A children's disease because it allowed no one to grow up without getting it, just as measles is, the adult population consisting of survivors only. Every mother, who looked down on her new-born babe, knew in her heart that it was one chance in three that it would die of smallpox before the year's end, and an even chance before it grew to five. Four hundred thousand died yearly of it throughout Europe.

When Cortez brought it to the virgin soil of Mexico it was estimated that 3,500,000 natives perished from it in one year. Let me give you the history of Boston alone:

Year.	Population.	Cases.	Deaths.
1721	11,000	6,000	850
1730	15,000	4,000	500
1751 . . . . .	.....	7,500	545
1792	20,000	8,346	....

In this last year of 1792 there was 10,655 of the population who had had it already. Eight hundred ran away, leaving a remainder of 221 who escaped the disease.

Well, have the times changed? In only one particular. The pandemic of 1875 was about the worst in the history of the world for extent and fatality. Boston of 1875, or Boston of to-day, would fare the same as Boston of 1792; Mexico would repeat its history but for the great boon of vaccination. The barrier which protects civilization must be a permanent one. We can't wait for the epidemic to come. It would surprise and overwhelm us. We must go out to meet it. Always, in season and out of season, we must religiously and persistently, in the face of indifference and opposition, keep up our vaccination. The school provides us the way. The children must go to school. They may not go without vaccination. School boards are ignorant; they are indifferent; so is the community at large. But we are not ignorant; we must not be indifferent. It is our duty. Let us make it always an observed routine duty.

One thing more: That is the risk of septic infection through careless technique at the time of the operation and through failure to protect the sore during its course.

DISCUSSION

Dr. YOUNG.—I would like to ask a question in regard to the School Law. They won't let a child come to school unless he is vaccinated; parents refuse to have him vaccinated, and he is sent home. Then the truant officer comes after him and forces him to go to school. What are you going to do about it? There is a conflict in the law.

Dr. TOTMAN.—I would like to answer that I would send something stronger than a truant officer after the parents. That is the only way you can answer that question. If there was any trouble I would send an officer after the parents.

THE DETECTION OF COMMUNICABLE DISEASES IN
SCHOOL AS A PART OF MEDICAL
SCHOOL INSPECTION

By H. D. SCHMID, M.D.

President Board of Health, White Plains, N. Y.

This is the title proposed to me for a paper to be read at this meeting by your esteemed chief. I accepted the proposition with great pleasure, because I have for many years labored for the welfare of the community in which I live as president of the boards both of education and health.

I know we medical men are very apt to shirk all responsibilities outside of our professional work, which is altogether wrong. Physicians have duties toward the State just as other men. I have always taken for my example, as a citizen, the late lamented Prof. Virchow, the greatest pathologist that ever lived. The most industrious of scientific workers, he yet found time to take most active part in the political life of his country. But he always labored in that department in which his scientific knowledge would make him of most value.

Where, I ask you then, could we medical men find ourselves of more use to the Commonwealth than in the educational fields, and especially in furthering that great object connected therewith, School Hygiene?

The State's life depends on the evolution of our free public schools. A higher and higher state of education alone is a surety of the perpetuation of the free institutions under which we live. And a higher and higher educational development cannot be thought of without a more and more perfect teaching and enforcement of *hygienic* laws. To neglect the hygienic condition of the pupils is to neglect their mental growth and impair their future civic virtues. Civic virtues! This word always makes me swerve for a moment from whatever I may be considering and deliver myself of a few words on the most important of all — "*obedience to the laws.*" Have you ever thought of the terrible fact that we are the most unlimited law-breakers in the world? We make no end of laws, and when they do not suit us, we break

them without the slightest hesitation. In my several official capacities, when I considered it my duty to enforce obedience to laws, I've been met with utmost opposition and been esteemed a personal enemy. Whence arises this moral defect? I am perfectly sure it comes from the lamentable lack of enforcing obedience at home and in the school — and lawless children make lawless citizens.

Unfortunately many of our people confound liberty with license — think it's *manly* in a *boy* to be uncontrollable and irreverent to his elders — and liberty loving in a *man* when he breaks an inconvenient law. Gentlemen! If there be a bad law, enforce it, and by so doing you will also force its repeal; but while it is in force, keep it. Pardon this digression!

School Hygiene, then, is a matter of vast importance. "*Mens sana in corpore sano*" is as true to-day as when it was first uttered. The preservation of health is a mighty factor in building up character.

It seems to me, therefore, much needed that all teachers should be instructed in this weighty science of School Hygiene before they take charge of a class of children. I believe, however, that the curriculum of normal schools does not include it in its many items. I have for this reason made it known in our district that I will give all our public school teachers a course of instruction in it this winter. I trust that many of my hearers will take steps at their respective homes to follow my example, and thereby impress the school authorities with the weightiness of this matter.

We outsiders may look for the children's health in the best possible manner; we may erect perfect palaces of schools; may see that the classrooms, the pupils' seats, etc., are planned according to the most minute demands of School Hygiene, and all this will give little benefit to the little ones if the teacher does not pay heed to the laws of hygiene, partly from indifference, perhaps more likely from ignorance. I appreciate the fact that the teacher should be competent; that is, have the knowledge to recognize in his school life all nonhygienic conditions, and to have the desire to see them abrogated in the interest of the children intrusted to his care, which, however, cannot be accomplished unless he knows himself means and ways guaranteeing to his pupils the best possible condition of perfect health.

I think we are very apt to forget entirely, or perhaps never bear in mind, that it must often be a precarious matter to let the

young child begin school life. And why? Because we take it from a life of unbounded freedom to one where he is shut up for hours in oftentimes a stuffy and ill-ventilated room, with perhaps too many children for the size of this room, and they perhaps unsufficiently clean, and where by the strict rules his nervous system may receive rude shocks as also by probable undesirable companions from wretched homes. The teacher should be able to recognize these conditions and how they may at first depress the young child's state of health, and thereby make it more easily receptive of disease germs. Above this, however, the teacher should be able to comprehend the psychological condition of the pupils, and, if so, will become what I call an "ideal teacher," *i. e.*, one who treats pupils as individuals and not as a class. There is much to be said about contortions of the spine by sitting in false attitudes, and other cognate points, but such cannot enter into this paper, whose great subject after all is the detection of communicable diseases.

The importance of medical school inspection in co-operation with teachers willing to aid in every way cannot be too highly estimated in many directions, and pointedly, I think, in the detection of communicable diseases. It is of such magnitude that in Hungary, for example, the school physician, appointed by government, devotes his entire time to the welfare of the school. How far distant are we yet from this advanced position!

Therefore, when this opportunity of speaking to you was given to me, I determined at once to call to your mind that by the great power vested in the health boards, you can, as health officers, with your boards, do a large part of the work, which would naturally belong to medical school inspectors, without reference to the boards of education, who are often composed of men slow to appreciate the advances made in hygienic endeavors for the public weal. You are, no doubt, well aware how some people still exist (and not always the most illiterate) who are violently opposed to vaccination. This becomes known especially in connection with the law, which compels school attendance, and at the same time forbids children to attend school unless they have been properly vaccinated. It seems to make no difference in the minds of these opponents when you bring to them ceaseless examples of the blessing it has conferred on communities and nations. Most prominent of all is to me the very great success health reforms have produced in the old German city, Augsburg, formerly often

almost decimated by epidemics of typhoid, cholera and smallpox, whereas now these have been entirely stamped out.

Very instructive I have found the statement referring to another European city, that tuberculosis in the time from 1876 to 1903 has furnished fewer deaths than ever before, but that this does not include those of school age, meaning, of course, the young, from five to fifteen years, during which the decrease of the number of deaths has not kept even with the rest of the years, nor has grown larger, and has outnumbered those from all other illnesses, as, for example, diphtheria, whooping cough, measles, dysentery, scarlet fever and typhoid. What does such a fact show? Plainly that the source of infection is not only the home, but also the school, and not only the pupils, but also the teacher. Of course, this is doubtless of less magnitude in this country than in Europe, and less in country districts than in large cities.

It always makes me sad when I see how the poor little ones in the tenement-houses of our big city of New York have to live in horribly stuffy narrow quarters and get fresh air only on the sidewalks. It shows, however, how this terrible disease, tuberculosis, comes as much under medical supervision in schools as the more prominently communicable diseases. It goes without saying, that the school, because it assembles children from different homes and brings them into close contact, becomes under certain conditions a medium for the spread of infectious and contagious diseases. The recent better knowledge of the specific cause and propagation of such diseases imposes a still greater duty upon school authorities to exercise every care and precaution, and aid the health authorities in all ways in their endeavors to prevent the school from becoming an agent in the spread of diseases.

I noticed some time ago that in Chicago, I think in 1905, of 75,000 pupils, 4,539 were temporarily excluded from school on account of danger from contagion, which produced a very notable decrease in the mortality from infectious diseases, especially diphtheria and scarlet fever. By the way, I think it an important thing never to speak to the laity of scarlatina, the Latin name of scarlet fever, but always of scarlet fever, because with the majority the name of scarlatina has no significance at all. Unfortunately our school laws allow the employment of a physician only for vaccinating purposes, at least this is all that school boards attempt to do in the vast majority of schools outside the large cities.

Therefore, a large field is left for the interference of health boards. Fortunately, the power invested in them, as I mentioned above, is so extensive, so sweeping, that it requires mainly the energetic exercise of this power to supply as much as possible medical supervision school boards have failed or were not empowered to provide.

But in order to do such work effectively, the health board and the teachers should work together, and I will show further on the way of it.

It is with delight then that I found how in 1897, the city of New York appointed 134 physicians to visit the schools, which number later on was increased to 150, and no doubt is still larger at the present time. In 1899, the Board of Education of Chicago appointed fifty medical inspectors. In Boston that has been done since 1894. In Paterson, N. J., it exists since 1900; in Minneapolis since 1901; in Detroit since 1902.

When I was president of the board of education and of that of health, I could supply in a measure the absence of a regularly appointed, all-round school physician by having a resolution passed to empower me to call in the services of a properly qualified physician whenever there arose special need. If a case of any contagious disease occurring in a child was reported, a physician was employed to examine all the children of the class which the sick one had attended. If any of them appeared in the least suspicious they were at once excluded from school, directed to have the family physician called in, and were not admitted to school again until they brought a certificate of perfect health from their medical attendant. By this simple means a number of times the outbreak of an epidemic was prevented.

My idea regarding the plan which would work in any community where a school physician is not regularly appointed, or, if appointed, is not devoting his whole time to the school, I will herewith describe to you.

First of all, every new pupil entering school should be examined and at that time it is of special importance to make all possible inquiries regarding tuberculosis. In France, in certain schools all pupils must be examined every three months for tuberculosis, and cards are put up in all the rooms suggesting methods of preventing the terrible disease. All tuberculous pupils and teachers are excluded. Then all vaccination certificates and scars should be examined, and in doubtful cases revaccination demanded.

Then to secure the effective co-operation of all intelligent teachers, cards or little leaflets should be furnished to them containing instruction as to the detection of a number of the communicable diseases. If some false alarms are made it matters not, for this will be on the safe side for the school. It is better to make a mistake now and then than to leave a single infected child in the midst of the well ones. On these leaflets will appear the following short description of diseases.

First. Diphtheria.—Does the child complain of or has it sore throat, with or without a chill? Is it irritable or does it show nervousness by the trembling of the hands when writing, and does it appear somewhat feverish? The teacher finding this at once reports to the school physician or health officer. If it prove diphtheria, all the rest of the children of the same family must be excluded from school and none are readmitted without a medical certificate. And this readmission should not be granted until three weeks after perfect recovery, for the bacillus is often found several weeks in the throat after apparently perfect recovery. If culture tests prove total absence, the child is readmitted, but in the mildest cases ten days ought to be allowed to escape.

Second. Scarlet Fever.—It is impossible to see much about it till vomiting, sore throat and fever have set in. The rash appears later, and in mild cases all the symptoms are not much in evidence. Send the child home to stay there for at least six weeks. All children from the same house must also be excluded for one month, for they may have the disease in a very mild form, and, you know, from the mildest case a very severe one may be acquired.

Teachers will bear in mind that this disease occurs mostly in fall and winter and less in summer; also that if a child a week after exposure shows no symptoms of having taken it, it most likely will not do so at all.

Third. Measles.—A very contagious disease. It breaks out in from seven to twenty-one days after exposure, though I saw once a case that succumbed twenty-eight days afterward.

Unlike scarlet fever, the contagion of it is soon dissipated. It is most virulent in spring and least so in autumn. A child should be excluded for four weeks, and also the other children of the same household. As a general thing people do not consider it of enough importance, and yet the fact that it predisposes to pulmonary diseases makes it dangerous.

Medical certificates, however, are not needed because its contagion dissipates so soon.

If an epidemic exists, look for children complaining of headache, pain in back, dullness.

It is far more dangerous in infants than in older children.

Fourth. Whooping Cough.—Mainly known by the convulsive cough. If an epidemic exists, watch for a very persistent cough, even if no whoop accompanies it. Exclude the afflicted for two months. (Many physicians do nothing for this disease, which I consider a grave mistake.)

Fifth. Mumps.—Easily recognized by the seat of the swelling. Exclude children for ten days after disappearance of the swelling.

Sixth. Chicken-Pox.—Little vesicular eruptions without special disturbance of the system. Exclude children for three weeks after the appearance of the first symptoms.

Seventh. Contagious Conjunctivitis.—The linings of the eyeballs and lids are red. There is a discharge, first watery, then mucous, then yellow and sticky from mucous and pus; the eyelids glue together. Exclude all sick ones till well. After having been sent home, the balustrades, desks, seats, door-knobs and other parts of the door handled must be washed with an antiseptic solution.

Eighth.—All skin eruptions must be referred for examination to the physician.

Ninth. Chorea.—Should be excluded, for it will be acquired by imitation.

A thermometer should be given each teacher. The teachers provided with these leaflets, giving hints as to the detection of the diseases just read, shall be required to notify at once the medical school inspector, if there be such official, or the health officer of the district, if no school inspector exists, whose duty it shall then be to make an examination of all the children of the class in which a contagious disease has been discovered, and to send all, even mere suspects, home for further observation by the family attendant, by whose health certificate alone they can be readmitted.

I think when these diseases break out in a boarding school, the pupils should not be allowed to go home until the attending physician has decided that they cannot carry the infection with them.

I have said nothing about typhoid fever because this would go beyond the power of observation of a nonmedical person. But it

gives me the chance of impressing upon you the importance of your inspection of the milk supply, because in milk we find so often the seeds of illness induced in the consumer. And since it enters so largely in the diet of children of school age, it is proper that in the prevention of typhoid fever especially it should be spoken of. It will astonish you when I tell you that in the German Empire alone more than \$425,000,000 worth of it is consumed yearly. Its supervision is of vast importance, and I am convinced that this should begin at the stables, and it would be of immense benefit if in each village and city the sale of all the milk came through some great central establishment, and not through any number of smaller dealers, because one central establishment can be watched and guarded hygienically far better and easier than a number of small sales places where much neglect can be practiced.

Gentlemen! All hygienic measures are the therapeutics of preventive medicine—the great medical goal of the future. And since the future of our great Republic rests with the generations to come, and since it lies in our hands to make them better and better prepared for their great tasks, let us be up and doing. The intelligent physician par excellence is the *true* guide in all that concerns the proper development of our children.

And do not forget that amongst them are the untold numbers born of newly-arrived immigrants, often, alas! of the most undesirable “off-fall” of European nations—full of ignorance, steeped in filth, foreign to every hygienic principle, and yet, by birthright, citizens of this great Republic.

Then let us all strive to be such guides, preparing all these millions of budding citizens for direct and indirect self-preservation, for parenthood, for citizenship and the miscellaneous experiences of life.

Dr. TOTMAN—I think I can say truly that we have listened to a great paper. I did not know much about what I was introducing when I gave the gentleman's name, but I know more about Dr. Schmid now after having heard him.

I am going to introduce to you the gentleman who will present the next paper by telling you that yesterday I got in touch with him. I was going to take the ride to Niagara Falls and was going to view the nice scenery and get a good deal of instruction from the scenery. I came in touch with this gentleman and before I knew it, I was in Niagara Falls and I had my head full of a good deal of important matter on the very subject that Dr. Harlan P. Cole is to present.

THE PREVALENCE OF PHYSICAL DEFECTS IN
SCHOOL CHILDREN

BY DR. HARLAN P. COLE

Consulting Orthopedist, State Department of Health

I am a little bit embarrassed by this introduction but hope I may not entirely disappoint all of you—the gentlemen who attended the banquet last evening heard a very good introduction to my paper in the remarks of the last speaker to the effect that if you wish to conserve the health of the adult, you must begin with the child. The Church tells us—give us the child and you may have the adults. It has been aptly said that “the boy is the father of the man.” Again—“As the twig is bent the tree is inclined.”

The Conferences are conducted for the devising and executing of plans for the prevention of disease. One of the best means of avoiding disease is the developing of a symmetrical, healthy body.

Orthopedic—technically defined—means right child. A child cannot be right if anything about him is wrong. If one thing about a child is wrong every other part is in some measure affected or disturbed thereby.

I would not attempt in any way, or to any degree, to divert your attention from the importance of the consideration of communicable or infectious disease, but to remind you that if the soil on which these German germs, Parisian parasites, or Hibernian microbes fall, is in proper condition to dispose of them and prevent their development, we have established at least one means of preventing the spread of disease.

If all the members of the body are capable of performing all their functions, the owner of that body will be less liable to become a public beneficiary.

The amount of attention which is being given to the examination and supervision of the children in the schools of the State of New York renders it unnecessary for me to say much regarding the importance of the subject. I can most heartily indorse all efforts in this direction, not only as a right, but as a duty of the State, that each coming citizen may be better able to meet the duties of life and be less liable to become a public beneficiary.

In most families the regular attending physician has had occasion to become acquainted with the liabilities and weaknesses of his flock, and attends to them; but in these days of the Osteopathist who seldom looks beyond the “dislocated vertebra,” and the Scientist who believes that God is love and all is well, slight physical deviations are liable to be overlooked and many a child may go on into life having already laid the foundation of a difficulty that would make life a burden and a successful career an impossibility. But the large majority of those who attend the

public schools come from families where on account of numbers and the need of all available ones to contribute to the general fund, the slight departures and difficulties, and often the greater ones, are sadly overlooked or neglected.

As the body requires the full performance of all of its functions in order that it shall be self-sustaining, it follows that the loss or impairment of any of them subtracts so much from the physical perfection. But it does not end here, for as no organ is entirely independent of the others, the whole body may thus be disturbed. As the loss of a nail from the horse-shoe eventually led to the loss of both horse and rider, so the maladjustment of the teeth may, through imperfect mastication and digestion, cause defective nutrition and lowered vitality, as will also a wasting of the nerve forces through continued eye-strain, an adherent prepuce or an irritable rectum.

It is a well-known fact that the continuous, judicious and systematic use of the lungs by properly trained singers and elocutionists tends to better nutrition and better circulation; and that the homes for consumptives do not contain many delegates from these ranks. The delicate, quiet children who do not speak loud or play games, but sit long hours in a stuffy room curled up in a large chair, reading large books, usually develop a depressed sternum, flattened chest and a contracted lung.

If the expanded and developed lung of the singer avoids consumption, certainly the depressed and flattened chest of the quiet, playless child, that prohibits lung development, lays a very broad foundation for the disease. Children are continually warned against putting their arms over their heads, whereas that position is the most favorable for the free expansion of the lungs, for the ribs are thus raised by the pectoral muscles, giving the chest cavity the greatest possible antero-posterior diameter and removing all weight from the upper part of the lung. The use of a spirometer, if carefully supervised, and not used for competitive test, might be of value in the schools; but the regularly conducted singing exercise, carefully followed, would be of great assistance in expanding the chest and bringing a greater quantity of new air to the top of the lungs. It seems to me that too much cannot be said regarding the conformation of the upper part of the chest and the position occupied by the child during school hours; for whatever may be done to prevent tubercular infection, all must at some time become exposed to it to a certain degree, but if the

lungs be in good rugged condition and frequently swept by a large volume of new air, the probability of lodgment and development of germs will be greatly diminished.

Anything that tends to a depression of the chin, a backward inclination of the top of the chest and a forward projection of the abdomen proportionately flattens the upper chest wall and makes it more conical. Nearly all consumptives have receding shoulders, protruding chins and a capital A-shaped chests.

If we could convert the shape of the chest to a V, instead of an A, toward which the habits of inactivity tend, the immunity from consumption would, I am sure, be much greater, for the direction of the bronchi tends to send the air to the bottom of the lungs rather than to the top. It is a well-known fact that the doctor, who for self-protection slumps into the well-cushioned seat inside a stuffy carriage, even though it be perfectly aseptic, is of shorter life and more ill than the one who is outside and does his own driving.

The great question of the day is the question of vitality and utility, general and local. The one is dependent on the other and the other on the one. Like the two sides of a partnership, the buyer cannot progress without an equal activity on the part of the seller, and the seller cannot have the goods if the buyer does not produce them. The body cannot move if it has not the vitality or power, and the other side of the simile is more accentuated in this case, for we cannot get the power from outside, but are compelled to develop it within our own bodies by our very activity. An idle member is a weak one, and an entirely useless one goes on to total destruction; therefore, our development progresses symmetrically with our mobility and the use of it, and our deterioration with anything that in any way interferes with our possibilities. The prefix *de* in the word defects does not infer or imply but positively declares a subtraction, a lack of or loss of some faculty or portion of it that should exist in the scale of perfection, and renders the individual not only less able to compete with others in the life race, but leaves him the more liable to the development of other weaknesses on account of limited activity.

Much is said and done about physical culture, and it seems that all the more recent moves are in the direction of more variety and intensity rather than discrimination. In a recent issue of one of the daily papers of New York city appeared a letter more

than two columns in length from the assistant director of physical training in the city schools. The whole paper, while perfectly sound in all its statements, deals entirely with the question of laxity of appreciation and execution of all that is included in the general plan of physical development. In a recent lecture by a celebrated teacher from Harvard University, before a society for physical culture, about the same idea was carried out. In neither case was any mention made of the possibility that there might be something in the way of the mechanical ability of the child to carry out the prescribed directions; and nothing of the gradual, insidious, unobserved oncoming of a local weakness that is disguised in its earlier stage by some adjustment of the weight-bearing forces until two, three or even five years later, when, after some apparently trifling illness, it suddenly appears a well-developed deformity. To illustrate:

A young lady of fifteen in a well-to-do family was recently brought to my office on account of the following condition:

One hip was noticeably higher and larger than the other; there was an abrupt concavity at the side just above the higher hip, as compared to the opposite side; a continued dull aching at the top of the shoulders, aching in feet and legs, especially on the inner side; she tires quickly, can walk but little; spine slightly but noticeably curved, one shoulder more prominent.

"All this has appeared within two months" is the statement of patient and physician, directly following a mild malarial attack.

The condition has undoubtedly been developing during the past three or four years, but was masked by adjustment until the attack of malaria which weakened the power of adjustment enough to allow the deviation to show. In this case, as in many others, no evidence of any weakness or local disease could be found above the feet, but here there was a decided tendency to pronation, much greater in one than the other. The weaker foot revolved inward on its long axis, allowing the inner side of the foot to come nearer to the floor, thus letting down the leg which rests on the inner row of bones and dropping that hip. This is a picture of but one of many similar conditions that begin early in life, but are not noticed, as it might and should be.

But looking more specifically at the title of my paper, let me quote some remarks from those who have given some study to the subject. In a recent issue of the Journal of the New York State Medical Society appeared a paper on pronated foot, containing

the remark, "The prevalence of weakened conditions of the foot in modern life is astounding, and undoubtedly the beginning of that condition is made in early life. * * * The majority of cases do not come for treatment during the early stages of simple pronation. The cases are either unrecognized or neglected and so are allowed to develop into a more advanced, weakened condition, in which the discomfort to the patient becomes so pronounced as to demand attention. Any one doubting the frequency of pronated foot should stand in front of any public school at closing time and watch the feet of the children as they come out."

Dr. Dearholt of Milwaukee, in a paper entitled "Static Foot Disorder," says:

"The work has been in a special department of surgery and in a department which has apparently little interest for the general practitioner. It has seemed to me, therefore, that I could succeed best in this paper by confining my entire effort to an attempt to stimulate an interest in the minds of practitioners toward a series of conditions that my experience has led me to believe are almost entirely misunderstood.

"Considerable confusion has arisen from the application of names founded on an anatomical basis for conditions which are in reality physiological. I am thinking particularly of the name flatfoot, which is commonly used to denote a symptom-complex which is not necessarily due to flattening of the arch, but may on the contrary be found in many conditions. For this reason I have chosen the broad title Static Foot Disorder, as affording an opportunity for covering all possible errors in weight-bearing not primarily due to congenital or acquired faulty structure."

Dr. Gillette of St. Paul, in a paper entitled "Some Orthopedic Conditions Causing Sciatica," says the following:

"Sometime prior to reading a certain article, I had found a number of conditions which caused sciatica. For instance, several cases of severe flatfoot, after the arch was restored, were relieved of the sciatica. One can readily understand how this might be possible, for from a sudden breaking down of the arch of the foot there must be a great deal of irritation of the plantar nerves. One very severe case of sciatica was cured after a proper shoe was adjusted to relieve a Morton's foot, which is, as you know, a pinching of the external plantar nerve between the ends of the bones, or to pressure of the metatarsals or other digital

nerves. This case was proved, beyond a doubt, to be sciatica, due to the pinching of the metatarsal nerves, for after a year or two she returned again suffering from sciatica as she had discarded the wide-toed shoe and was again wearing the fashionable pointed toes. Readjusting proper shoes again relieved for the second time the sciatica.

"One year ago this winter a school girl suffered from pain, seemingly beginning at the heel and extending up the leg to the thigh muscles. This girl was wearing a short shoe and had as a result a post-calcaneal bursitis, sometimes called a painful heel or achillodynia. Her sciatica pain was entirely relieved by a longer shoe and by splitting the heel of the shoe in the middle line behind, and setting in a loose piece of leather between the separated edges."

Dr. Frischbier of New York, in a paper entitled "Pes Planus from the Viewpoint of Neurology," states as follows:

"The relatively large number of cases coming to the clinic of Prof. Collins at the New York Post-Graduate Hospital for the relief of pains in various parts of the body, in whom after careful examination flatfoot or weakfoot is found as the sole attributable source of such pain, has led me to believe that the discussion of this subject might be profitable.

"Although the pain of flatfoot is usually of the feet and legs, it may be of any part of the body, for I have seen improvements of flatfoot in most instances followed by a cessation, or at least amelioration of aches and pains in remote parts. From an analysis of 125 cases, I feel justified in regarding congenital or acquired weak and flatfoot a source of irritation capable of causing widely-scattered pains and discomfort to a degree of depression and exhaustion in particularly susceptible subjects. In all cases and all degrees of flatfoot we naturally expect to find local pain or tenderness about the foot, ankle or leg and these sensory disturbances frequently are not commensurate with the development of deformity, so that in the beginning destruction of the joint, long before any noticeable change of outline, the pains are apt to be the most severe and continuous. Quite frequently also the pains appear localized at first about the knee or hip joints, and later travel downward to concentrate themselves about the member at fault. In 56 cases pains extended to the thighs; in 47 there was great pain in buttocks and lumbar region; in 39 the pain was first felt in hips, thighs (anteriorly) and inguinal region; in 34 cases there was backache up to the shoulder blades; in 21 extreme general irritation, followed by

depression; in 17 there was pain in back, also right or left arm; in 4 cases there were restlessness, insomnia, pains worse at night in opposition to the general rule that resting relieves pain.

"The dysesthesias were variously described as pressure constriction, numbness, dull ache, or pains of shooting, stabbing, pulling or throbbing character. The extremely ingenious method of taking an impression of the feet upon specially prepared paper by means of the ferrocyanide of iron reaction having failed so often to reveal deformity, simply because of the insidious joint change residing only in the upper parts, we must rely upon the following:

"1. Other causes being excluded, increase of pain on active and passive manipulation of the joint, on standing particularly, on walking, jumping; tenderness on pressure over some or all the bony prominences, as the scaphoid, metatarsal heads, os calcis, etc., and impaired mobility of the ankle joint somewhat impeding adduction, limiting extension, and causing a feeling of constriction or weakness of the joint, point to weakfoot, beginning flatfoot.

"2. More advanced cases present greater prominence of the internal malleolus and astragalus, with corresponding depression or gradual effacement of the fibular landmarks. Weakness is more pronounced at the inner side of the foot and ankle; there are strain and ache of these parts and the calves. Coldness, numbness, hyperidrosis, all aggravated by atmospheric changes, are noticed. Discomfort and tire after short walks necessitate frequent rests, during which the joint components partially reposit themselves in the normal order, shortly after again to be jarred and jounced, and stretched apart, so as to cause renewed and increased torture. The patients become more or less awkward in their gait, watch their footing more in order to avoid rough or uneven places (cobblestone pavements, ruts, obstacles), feel less secure on their feet, use their heels more than their toes and wear away the inner side of the sole of the shoe.

"3. When the deformity has become evident the gait and station may change to an actual wobbling, limping or staggering, and slight efforts of the pedal extremity may require such an excess expenditure of energy and force as to tempt the patient to remain inactive, or at least to save locomotion. As above mentioned, the pains usually are not so severe in this stage, being replaced by a transient dull ache."

It is not necessary for me to occupy your time with any extended remarks about any of the glaring deformities, for these

are readily recognized, and the title of my paper limits me to defects.

The one particular point I wish to make is that these defects are, as was stated in one of my quotations, seldom anatomical, but almost invariably physiological; that is, they are functional in their development and dependent on either a limitation or arrest of function, and not primarily dependent on a structural change. It may be brought about by an interference with or arrest of motion at the point where the defect is recognized, or by lack of balance of power in the weight-bearing parts of the body.

As the bony framework is so adjusted that the axis of one weight-bearing bone is never in direct line with that of its next neighbor, the weight is never passed directly from one bone to another, but the bone below receives it at an angle. This direction of the force tends to push the lower bone to one side, which tendency is only resisted by the muscles, for the ligaments are so attached as to admit of that motion if occasion requires it.

The four curves in the spine, the forward tilting of the pelvis, bringing the weight line of the spine in front of the acetabulum; the forward inclination of the femur and backward inclination of the tibia, and the inward rolling of the foot at each step, all beyond the power of voluntary action to prevent, and all necessary to prevent concussion of the brain or the fracture of our bones unless they were double their present size and strength; all testify to the fact that position is maintained by balance of muscle power; that diminution of general muscle power in general will result in a more pronounced anterior curve in the lumbar vertebræ, adding to the pot-bellied appearance of weakly children the weak knees and the exaggerated inward rolling of the feet, called flat, weak or pronated foot.

In case of lack of balance of power in the two sides of the body or in the two sides of the spine or of one leg, there will be a departure in the direction of the weakness and an immediate attempt at adjustment. This adjustment is easy in the beginning, as it is easy to walk on a side hill for a time, but the departure, like the fork in the road, is slight at first but grows gradually wider, requiring progressively more accommodation, until some slight illness destroys the power of accommodation and an actual deformity is suddenly presented.

Strains often fail to recover after good treatment because the disposition of the foot to roll at each step produces repeated

strain at the joint. The foot may do well until brought into use, when it will immediately begin to redevelop a part of its former soreness. The resulting inflammation will deposit plastic lymph among the tendons and ligaments, thus increasing the size of the joint and limiting its motion, and we soon discover that the muscles which should move this joint are becoming atrophied from lack of use. A splint or brace, or the adoption of any position that limits the use of any joint, will result in the same degeneration in proportion to the amount of the cause.

I have said so much about the defects of the weight-bearing parts of the body because they are insidious; are much more frequent; are seldom located at the point of cause; are usually brought about by adjustment of parts to support weight; the initial departure is most frequent at the ankle, and progressively less as we ascend; one defect usually results in another, and the secondary is liable to be treated for the primary; and they can usually be remedied by assistance and almost never by force, but are almost always increased by force.

All parts of the body are liable to defects from local injury, local inflammation, prolonged maintenance of one position, surgical dressings or surgical operations, splints, bandages, braces, plaster-casts, tenotomy and tendon transplanting, and paralysis.

One of the writers from whom I quoted wrote his paper for the purpose of stimulating more interest in the general profession on this subject. My object is a similar one; let us promote that object by referring the defective children, as we find them in the schools, to their physicians for supervision and readjustment in the early stages of any departure.

The pianist trains his fingers, the dancer his toes, the gymnast his whole body. The pianist develops what is called a neuritis of any part of the arm or neck, particularly in the ulnar nerve, by strain or drag upon the cervical nerves. The dancer, gymnast, the teacher of physical culture, doctor, nurse, waiter, floor walker, postman, policeman, porter, school teacher, or any other person who stands much or who is heavy will develop a pronation of the foot called flatfoot or broken arch, which will produce deviations or pains anywhere above, even to the neck; neuritis, knock-knee, bow legs and backache.

The child develops his postural difficulties through lack of balance of power due to rapid growth, imperfect convalescence from some of the children's diseases — polio-myelitis or cerebral

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disease. None of these conditions will improve under any form of physical culture because their condition and position prohibits the execution. Children are scolded for assuming positions that it is impossible for them to prevent, taught motions they cannot carry out, and braced at points and in ways that they should not be. Correction of adjustment must first be accomplished and that will usually have to begin at the foot.

THE DETECTION OF DEFECTS OF THE EYE, EAR,
NOSE AND THROAT

BY DR. H. D. SCHENCK

Consulting Ophthalmologist, State Department of Health

At this conference last year the necessity for the examination of the eyes and ears of school children was presented. This showed that, with the exception of a few of its largest cities, New York State was much behind many of its neighbors in the important matter of properly equipping our school children for the most effective work.

The last United States Census enumerated more than 20,000,000 school children and school property valued at more than \$700,000,000. Of these children there are in this State many hundreds of thousands whose capacity for seeing, hearing and properly breathing has not been determined. Many of these, unless the defect is early ascertained and corrected, are kept back in their school work, and subjected to mortification and discouragement because of their inability to keep up with their grade. They are the cog in the great machine of present day education, which is defective, putting the plant in poor working condition and entailing extra efforts on the part of teachers and pupils to make these defective wheels do their work. Many times the task is too heavy and they have to be dropped out. Many of them continue to work with this great handicap of unknown physical defect until they have seriously undermined their nervous system and stunted their physical development beyond repair, because of this extra tension put upon them by defects of sight or hearing, which can be easily detected and corrected.

The criminal classes are largely recruited from the uneducated, who drop out of school because their parents are either ignorant, careless or helpless in regard to having defects of their eyes, ears or nasal apparatus corrected, so that they may easily keep along in school. About every truant (about 98 per cent.) in the city of New York is in some way physically defective, as are 95 per cent. of those backward in their school work. Mind this and listen to these figures. In all our institutions for the feeble-minded bril-

liant cures are being made by correcting the simplest physical defects in the teeth, nose, digestive system and even in some cases by curing an obstinate skin affection. Gelpe found 72 per cent. of physically and mentally defective children to have defective eyes and the worse the mental condition the worse were the eyes. If such children can be improved is it not an imperative duty to not only prevent others from getting into this condition but to help these defectives to greater things?

With over one-third of our school children having defects of the eye and more than another third with defects of either the ear, nose or throat (between 70 per cent. and 80 per cent. of the total) it would seem that there could be no possibility of any one, with these facts before them, failing to at once appreciate the necessity for a method being introduced that would ascertain what these defects were and would present a practical method for correcting them.

The number of communications which were received regarding the time and manner of such an examination from all parts of the State, together with the interest manifested by the members of the Conference last year, made the Department determine to take steps to institute an examination on the lines then outlined.

This follows the plan of most of the cities where such examinations are held, as well as our sister States, of having the examination of the pupils of each class made by its teacher. For this year it was determined that the plan had better be tried only in the incorporated villages. First, because very little money was available for the work, and, secondly, because the schools could be more effectively and easily managed in the villages, where most of them have a principal and usually a group of two or more teachers. Public sentiment too in these communities would be more likely to make the examinations successful and we could secure the co-operation and support of boards of education where greater interest would be shown than in the country.

There must be a distinct demand and public sentiment for such examinations before they are taken up in the country schools where the single teacher employed is oftentimes only making the position a stepping stone to some other occupation. With the indifference of such teachers and the failure of many of the trustees to appreciate the advantages of these tests there will be much troublesome apathy and opposition to overcome. The num-

ber of villages sent us by the Department of Education was 447. In 397 the boards of education and the number of teachers were given. In fifty no officers were noted. There are 4,181 teachers in these 397 villages, an average of over ten per village, with a probable average of between thirty-five and forty pupils to a teacher; a total probably of nearly 60,000 pupils to be examined.

The Department of Education furnished the heads of the boards of education in the villages with a number of teachers and the probable enrollment in each room. That Department will also have its institute conductors give the teachers practical instructions in these tests and aid in arousing public sentiment to the necessity for these examinations whenever the institutes are held.

At the end of this paper is appended a list of the villages which have been selected for this year's examination. The boards of education or other authorities in all these towns have been sent sets of cards for testing the vision of the children at twenty feet and for the amplitude of accommodation (illustrating these sets). The following letter was addressed to these boards when the cards were issued:

To the President of the Board of Education:

The last census shows that there are 20,000,000 school children in the United States. The results of the examination in many cities and towns show over 7,000,000 have some defect of one or both eyes and over 7,000,000 more to suffer some defects of the nose, throat or ear, which greatly impedes their progress in school — that is, more than 75 per cent. of our school children suffer from some defect of the eye, ear, nose or throat.

In view of this statement which is a quotation from the report of the sixth annual conference of sanitary officers issued by this Department, and because of the recent widespread agitation in regard to the subject of defective eyesight and hearing of children in schools, we are making an endeavor to ascertain the facts in regard to the eyesight and hearing of the school children of this State as is done in some of the more progressive States.

Under separate cover the Department is sending to you material for the purpose of testing the eyesight and hearing of the children in your schools, and we earnestly request you to give this subject not only your careful attention, but also your sympathetic and interested co-operation.

The instructions to teachers are sufficiently explicit to enable even the unskilled to make the test, and if this test be made under the interested direction of the principal or superintendent, there can be no question of the value of the results.

This examination is made, as you will note, without instruments of any kind and the tests are perfectly harmless and painless. The suggestion should be made to the teachers not to touch the child during the examination, and not to coerce any child whose parents object to having the examination made. All clashing with parental authority should be avoided if possible.

Sometime during the week beginning October 14th should be set aside for this examination, and each teacher should be able to examine at least six pupils per hour. This will enable you to have the report from your schools returned to the Department by October 20th.

Bespeaking for this movement, which will mean so much to the coming generations in your community, your hearty and cordial co-operation, I am,

Very respectfully yours,
EUGENE H. PORTER,
Commissioner of Health."

With the test cards were also sent the following instructions for the teachers to make the examinations:

1. Children under 7 years need not be examined.
2. Children wearing glasses should be tested with their glasses properly adjusted to their faces.
3. Children should be examined singly and privately.
4. Ascertain whether the child habitually suffers from inflamed lids or eyes or after study has weariness or pain in eyes or head or is suffering from squint (eyes crossed).
5. Find whether the vision is normal by the large charts. Do not expose the charts except when they are in use as familiarity leads to memorizing the letters.
6. The chart should have a good side illumination and not be hung in range of a window which will dazzle the eyes. It should be on a level with the head and at a measured distance of twenty feet from the child who should sit facing it. Examine each eye separately by holding a card or other screen close in front of one eye while the other is examined, but do not have the test made with one eye closed by pressure or otherwise. Test the right eye first by having the letters named in order from the top downward. For the left eye have the letters named from right to left to avoid repetition from memory.
7. Where the child cannot name the individual letters, although able to read, the chart of figures may be used. It may also be used as a control test. If the child does not know figures or letters,

use the chart of inverted E's, asking the child to tell by a movement of the hand the side on which there is an opening in the E's in the different lines, *i. e.*, up, down, right or left.

8. If it is suspected that the answers are being made from memory, a hole about one and one-half inches may be cut in a narrow strip of cardboard so as to allow only one or two letters to show through the hole, and by skipping around rapidly it is easy to break up the memorizing of the letters.

9. The lines on the three large charts are numbered 200, 100, 70, 50, 40, 30, 20. These indicate the distance the respective letters should be read by the normal eye. The record is made by a fraction, of which the numerator represents the distance of the chart from the child, and the denominator the lowest line he can correctly read. Thus if at 20 feet he reads the lowest line the vision is 20/20, or normal. If he only reads the line above, the vision is 20/30, or 2/3, the normal. If he cannot read the largest letter he must go *slowly* toward the chart until he can. The distance he is from the chart when he can read the largest letter will be the numerator and 200 the denominator. Thus, if he could not tell the letter until he is 10 feet from the chart, his vision will be 10/200, or 1/20, the normal.

10. The eyes should also be tested at the near point and separately as with the large chart, the scholar being seated with his back toward the light and with the small chart well lighted. Begin at eighteen inches and steadily bring the chart nearer and nearer while the scholar continues to read aloud. When he can read no further, measure the distance from his eye to the chart. If the child has difficulty in reading the chart, he can spell the words, and the test will be determined by his failure to pronounce the letters correctly.

11. The fractions 20/20, 20/40, 10/200, etc., will record the distant vision (20 feet) of each eye. Reads, right eye, — inches up to — inches; reads, left eye, — inches up to — inches, will record the focusing power of each eye; as, R. E. = 16 up to 4 in.; L. E. = 15 up to 3½ in.

EARS

1. All children should be examined.
2. Children should be examined singly and privately.
3. Ascertain whether the child has frequent earaches, has pus or a foul odor proceeding from either ear, suffers from frequent

"colds in the head," is subject to a constant catarrhal discharge from the nose or throat or is a mouth-breather.

4. Seat the child facing you near one end of a quiet room, with the windows *closed*, and begin the test of the hearing at a *measured* distance of twenty-five feet. The test is made by having the left ear tightly closed with the finger while you observe the ability of the child to repeat your *moderate* whispers of numbers between 21 and 99, inclusive, avoiding those with cyphers, as 75, 55, 37, 22, etc. Test the left ear with the right tightly closed. Avoid having a wall behind you to act as a sounding-board. The figures should have as nearly equal emphasis as possible, and the distance at which the child correctly repeats a series of three numbers gives his hearing distance for that ear. No further test is necessary if the child hears the numbers perfectly with each ear. If this test shows a slight defect of either ear, further tests may be made by observing how the child hears the tick of an ordinary watch, which should be heard normally at a distance of not less than three feet.

5. The hearing is recorded by a fraction, of which the numerator represents the distance you are from the child and the denominator is 25. If he repeats the numbers correctly at 25 feet his hearing is $25/25$, or normal. If he only repeats the numbers correctly when you are at 20 feet, it is $20/25$, or $4/5$, the normal, and at 12 feet, $12/25$, etc.

CARDS AND REPORTS

1. These examinations should be made annually in October, and after the midwinter examinations in the case of new pupils.

2. All the charts should be kept, without rolling or being folded, in a clean, dark place, to prevent the yellowing of the paper.

3. Send at once a properly filled blank to the parent or guardian of all children whose vision is *less* than $20/20$ in either eye. Do not fail to report cases where the vision is $20/20$ if the child is backward in school work, suffers from any abnormal condition of the lids, inflamed eyes, has a discharge from either eye or *frequent headaches*.

Report all cases where the hearing with either ear falls below normal, or the child suffers from any of the conditions mentioned under "Abnormal Conditions — Ears."

4. Mail to the State Department of Health a report, giving the name and age of all children examined. Where the distant

vision is 20/20, the focusing power 18 inches up to 4 inches, and there are no abnormal conditions of the eye or lids, or headaches; and where the hearing is normal in each ear, without any other abnormal condition, leave the spaces opposite each name vacant.

The vision and hearing are recorded in the proper spaces for each by fractions, as explained above. All abnormal conditions of the eyes, lids, ears, nose, throat and headaches are to be recorded by proper abbreviations under the respective headings.

This report must be filed with the Department within ten days.

The report blank which the teacher is instructed to fill, with the name and age of every pupil examined and where there are defects to note them, contains the following headings:

Name.

Age.

Distant vision (20 feet) R. E.; L. E.

Focusing power (inches) R. E.; L. E.

Eyes; Inflam. Disch. Squint.

Lids; Inflam. Scaly, Swollen.

Eyes; Pain, Fatigue after use.

Headache; Daily, Weekly.

Hearing; R. E.; L. E.

Ear; Pain.

Ear; Disch. Odor.

Nose; Colds, Catarrh.

Throat; Mouth-breather.

Cases reported to parents or guardians.

Gen. Health; Remarks.

A number of blanks were furnished for making a report to the parents or guardians of such children as were found to have defects of the eyes or ears, or trouble with catarrh or difficulty in nasal breathing. This blank reads as follows:

eyes

son

ears

"An examination of your daughter shows the throat to be defective and below the standard required by the State Department of Health. This child cannot do *satisfactory* work in school until this defect is corrected.

ward

nose

You should consult with your family physician or with the health officer of the village as to the choice of an eye or ear doctor whom you advised to consult about the trouble.

"Teacher"

To each health officer in these villages was also sent the following letter :

"Dear Doctor:— The State Department of Health has sent to the public schools of your village the cards, instructions, etc., necessary for having an examination of the eyes and ears of your school children made by the teachers. This examination is to be made during the week beginning October 14th. If you can in any way, as the representative of the Department, aid in having this properly and intelligently done and reports made, we shall be greatly pleased. An examination ought to be made of the eyes to determine where there are any cases of acute conjunctivitis or trachoma. If any are found they should be excluded from the school unless they have proper treatment until the disease is cured. Those where the treatment is such as to take the contagious nature away from the discharge from such eyes may continue in school.

"While the Department desires the health officers to extend every possible aid in carrying out this proposed examination in conjunction with the Education Department, it would suggest that the utmost care and tact be exercised to secure and continue pleasant and harmonious action.

"The function of the health officer would be that of friendly suggestion rather than the exercise of any authority.

Very respectfully,

EUGENE H. PORTER,

Commissioner of Health

The examinations are expected to be held some time during the present week at whatever time the superintendent or board may determine is most convenient. Such an important matter would justify the suspension of school work during the half day that might be necessary, which would then not entail any additional work upon the teacher.

You will note these letters have said that the tests are harmless, painless, no instruments being used and the child is hardly touched during the examination. It was felt by the Department that perhaps some parents might object to the teacher's making this examination. It ought to be clearly understood that the purpose of this examination is only to enable the teachers to inform the parents, on the above-mentioned blank, that the defect exists. It is not, of course, for them to do more than *suggest* treatment.

You will also note that the letter to the boards of education says very distinctly that compulsion or clashing with parental authority should be avoided.

It is very necessary that this be appreciated in order that the working of the examination may be smooth and the best results obtained. The Department feels that the few parents who object will readily fall into line for the next examination, and that they will gladly have their children examined when they find how much benefit has been derived by some neighbor's boy or girl, possibly in the same grade, who has outstripped their child because of the improved equipment he had with the defects of his eyes, ears or nose corrected.

You will note also that the health officers in the town may be consulted by the parent or guardian in regard to getting competent professional advice for a child found defective. This was done for the purpose of giving the child's parents, where there was no family physician, some one in authority to look to for advice.

The great problem in successfully working out this plan will probably be among the very poor who feel unable to go to the expense of getting glasses or having proper treatment for their children. If each of you becomes interested in this work and uses tact and patience with the parents in giving advice, as well as with the educational and other authorities in your town having such matters in charge, this difficulty can be largely met, but tact and caution will have to be used if you would avoid making the whole matter unpopular.

Not only can you be of the greatest service to the Department in tactful work of this kind in individual cases, but your earnest efforts and services are requested in presenting to the educational authorities of your respective villages the advantages that they can secure for every child in the community by having this examination made. Impress upon them that New York State, which is in the van in everything tending to a higher civilization, is behind her sister States in looking after this important detail in the life of our school children.

These uncorrected and unknown defects have trailed along the whole life of many of the present generation. The State protects its minors in their right to property, prevents parents from abusing them, nor will it allow them to starve or squander the estate of their children; neither will the State permit parents to neglect the education of their children, to which the Commonwealth deems

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every child entitled. Surely then each community should see to it that these helpless children are given every facility for securing this free education, that it may not wreck them physically or mentally, and, by giving these wards proper equipment, enable them to complete their work so that they will be a credit to the community, of greater value to the State and the moral force, which every truly educated person exerts as a citizen.

<i>Name of Incorporated Village,</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Adams	G. W. Hannahs	10
Addison	Edward M. Welles	14
Afton	P. A. Hayes, M.D.	7
Akron	I. D. Eckerson	13
Albion	Sanford T. Church	28
Alden	W. H. Bass	5
Alexander	Earl Kidder	4
Alexandria Bay	A. H. Houghton	12
Alfred	C. B. Clarke	9
Allegany	George H. Pierce . . . . .	....
Altamont	Jesse Crounse	6
Altmar	Byron Heley	4
Amityville	Charles O. Ireland	13
Andes	Thomas W. Miller	5
Andover	Mrs. Addie Coleman	7
Angelica	F. W. Warner . . . . .	....
Angola	K. E. Blackney	8
Antwerp	G. H. Wood	9
Arcade	Henry J. Beardsley	10
Ardsley . . . . .	....	....
Argyle	E. H. Snyder	4
Athens	Fred. W. Titus	7
Attica	James G. Donance	12
Aurora . . . . .	....	....
Avoca	C. J. Harken	6
Avon	E. H. Babcock	8
Babylon	A. J. Woodruff	12
Bainbridge	C. M. Priest	7
Baldwinsville	Jos. F. Williams	22
Ballston Spa	C. O. McCreedy	23
Batavia	Harvey J. Burkhart	52
Bath	Andrew Crook	19
Belfast	W. D. Ault	9
Belleville	Chas. M. Overton	2
Belmont	W. P. Clark	9
Bergen	Herbert S. White	7
Black River	M. M. McGruer	7
Blasdell	W. L. Osborn	6
Bloomingdale	R. P. Towne	4
Bolivar	Geo. E. Wilson	11
Boonville	Garry A. Willard	12
Brewster	James K. Smith	10
Briar Cliff Manor	S. D. Ramson	5
Bridgewater	L. P. Curtis	4
Brockport . . . . .	....	....
Brockton	B. S. Sweatland	12
Bronxville . . . . .	....	....
Brookfield	R. E. Rollins	5

Conference of Sanitary Officers

<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Brownville	H. G. Stute	10
Burdett	A. Withian	4
Caledonia	E. A. Christie	8
Cambridge	Eliot B. Norton	11
Camden	John M. Young	15
Camillus	Edwin Sebring	6
Canajoharie	Stafford Mosher	14
Canandaigua	John Raines	35
Canaseraga	Walter I. Miller	6
Canastota	David S. Watson	22
Candor	O. J. Ward	7
Canisteo	Harrison Crane . . . . .	....
Canton	John Bird	19
Cape Vincent	C. A. Collins	7
Carthage	L. D. Thomson . . . . .	....
Castile	Silas L. Strivings	7
Castleton . . . . .	.....	6
Cato	Edward Kennedy	4
Catskill	Dr. Frank C. Clarke	29
Cattaraugus	Joseph A. Setler	13
Cayuga	Horace S. Wiley	4
Cazenovia	Patrick H. Donnelly	12
Celoron . . . . .	.....	....
Central Square	William Church	5
Champlain	Chas. W. McLellan	6
Charlotte	J. S. Kintz	11
Chateaugay	Merton E. House	11
Chatham	H. L. George	13
Chauumont	Hector Adams . . . . .	....
Cherry Creek	C. L. Edwards	7
Cherry Valley	Edwin Judd	7
Chester	Chas. W. Kerner	11
Chittenango	Like McHenry	8
Churchville	Dr. C. B. Ireland	7
Clayton	Geo. H. McKinley	14
Clayville	James A. Jordan	6
Cleveland	A. M. Bernhard	6
Clifton Springs	Albert Bosshart, Sr.	10
Clinton	L. M. Martin	15
Clyde	George H. Hoyt	15
Cobleskill	L. A. Hodge	13
Cohocton	John C. Mattice	7
Cold Brook	J. W. Moon	2
Cold Spring	James C. Woods	17
Constableville	O. Grant Harrington . . . . .	....
Cooperstown	Lynn J. Arnold . . . . .	....
Copenhagen	Fred. A. Green	6
Corfu	H. E. Stevens	6
Corinth	W. C. Randall	14
Cornwall	S. Briggs	10
Coxsackie	Henry A. Jordan	16
Croghan . . . . .	.....	....
Croton-on-Hudson . . . . .	.....	....
Cuba	S. V. Vaughan	11
Dansville	James M. Edwards	14
Dannemora	James H. McCorry . . . . .	....
Delhi	James R. Honeywell	13
Depew	John H. McCarthy	16
Deposit	E. D. Cumming	14
De Ruyter	M. E. Tallett	6

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<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Dexter	H. V. Clark	8
Dobbs Ferry	Wm. P. Brown	13
Dolgeville	Howard Spencer	13
Dresden	Geo. E. Goodrich	6
Dryden	Chas. Goble	11
Dundee	Clayton Q. Burch	7
Earlville	Herbert B. Bissell	17
East Aurora	W. E. Searle	6
East Randolph	Alex. Rhame	4
East Rockaway	H. E. Richardson	20
East Rochester	Cleland Noble	5
East Syracuse	J. M. Lewis	6
Eastwood	J. Irving Rhodes	5
Edwards	Albert A. Wheelock	5
Elba	C. D. Divine	6
Elbridge	W. G. Laidlaw	9
Elizabethtown	Amos Bauman	5
Ellenville	E. H. Knapp	6
Ellicottville	Wm. H. Bailey	19
Ellisburg	J. H. Snow	14
Elmira Heights	Walter H. Edson	13
Endicott	Dana H. Wells	4
Esperance	Frank R. Benjamin	16
Fabius	Benjamin Hammond	8
Fairhaven	Harry H. Dockstader	4
Fairport	Wm. P. Syper	8
Falconer	Oscar Jewett	24
Farmingdale	H. Seymour Vaughn	13
Farnham	Elbert O. Forbes	6
Fayetteville	A. Dallus Wat	11
Fishkill	Dr. Douglas Ayres	22
Fishkill Landing	Charles W. Harter	31
Fonda	Dr. Fred. N. Winans	5
Forestport	Stanley A. McKay	13
Forestville	Blair F. Simons	6
Fort Ann	Samuel R. Smith	5
Fort Covington	W. E. Sutfin	13
Fort Edward	F. A. McKee	6
Fort Plain	James A. Burr	5
Frankfort	W. F. Young	3
Franklin	Thos. Langley	6
Franklinville	Wm. R. Kinne	51
Fredonia	James A. Holden	13
Freeport	Joseph Merritt	30
Freeville	Arthur T. Johnson	14
Friendship	Henry L. Moench	9
Fultonville	Hiram J. Stevens	9
Gainesville	J. F. L. Cunningham	9
Galway		
Geneseo		
Gilbertsville		
Glen Park		
Glens Falls		
Goshen		
Gouverneur		
Gowanda		
Grandview-on-Hudson		
Granville		
Greene		
Green Island		

<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Greenport	Samuel P. Hedges	21
Greenwich	Dr. Henry Gray	13
Groton	Giles M. Stoddard . . . . .	....
Hagaman	John T. Moore	3
Hamburg	Dr. B. S. Bourne	15
Hamilton	A. N. Smith . . . . .	....
Hammond	W. D. Evans	5
Hammondsport	Linn D. Maason	10
Hancock	I. W. Seymour	12
Hannibal	J. R. Chamberlain	6
Harrisville	Dr. D. J. Culver	6
Hastings-on-Hudson	James E. Hogan	12
Haverstraw	Alonzo Wheeler	24
Hempstead	Chas. H. Ludlum	30
Henderson	David Noble	3
Herkimer	Stephen Taylor	36
Hermon	C. E. Mestern	5
Highland Falls	Christopher H. Stark	17
Hilburn . . . . .	.....	....
Hilton	H. S. Cosman	7
Hobart	J. R. Cowan	7
Holland Patent	W. D. Thomson	7
Holley	M. M. McCrillis	12
Homer	P. C. Kingsbury	16
Honeoye Falls	Benj. R. White	8
Hoosick Falls	Wm. J. Hyland	28
Horseheads	O. J. Bowman . . . . .	....
Hunter	James Jackson	5
Ilion	Albert H. Sumner	34
Interlaken	E. B. Van Arsdale	5
Irvington	Evan J. Smith, M.D.	22
Jordan	Stephen L. Rockwell	9
Keeseville	William H. Tindale	9
Kenmore . . . . .	.....	....
Kinderhook	William Heeney	5
Lacona . . . . .	.....	....
Lake George	Arthur F. West	6
Lake Placid	L. S. Parkhurst	15
Lakewood	Wm. C. Miller	6
Lancaster	Dr. John G. Miller	16
Larchmont . . . . .	.....	....
La Salle . . . . .	.....	....
Laurens	G. T. Kidder	3
Lawrence	Morris F. Craft	33
Leroy	F. A. Steuben	17
Lestershire	Dr. W. H. Wilson . . . . .	....
Lewiston	C. N. Hoffman	5
Liberty	James Goodsir	11
Lima . . . . .	.....	2
Limestone	William Paton	8
Lisle	Alonzo D. Lewis	5
Little Valley	Tint Champlin	8
Liverpool	A. B. Randall	8
Livonia	F. M. Davis	9
Lowville	Jay S. Bowen	15
Lyndonville	Chas. E. Fairman	6
Lyons	L. D. Godenbach	23
Lyons Falls	Harry P. Gould	6
McGrawville	Dr. D. E. Ensign	6
Macedon	C. P. Jennings, M.D.	5

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<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Madison	John Phelps	5
Malone	Charles S. Hubbard	38
Mamaroneck	Daniel Warren	11
Manchester	Dr. J. H. Pratt	7
Manlius	Fred. M. Barnum	11
Mannsville . . . . .	.....	....
Marathon	E. L. Adams . . . . .	....
Marcellus	Edward Moir	10
Margaretville	J. H. Hitt	7
Marlboro	Warren C. Grimley	6
Massena	H. B. Russell	6
Matteawan	Frank H. Brett	19
Mayfield	Edward S. Childs	4
Mayville	E. J. McConnell	9
Mechanicville	W. C. Crombie, M.D.	33
Medina	Francis H. Whipple	30
Meridian	David Gallant	4
Mexico	R. H. Baker	10
Middleburg	John H. Cornell	9
Middleport	A. G. Sherwood	11
Middleville	Dr. I. S. Edsall	6
Milford	Dr. C. S. Barney	6
Millbrook	William E. Smith . . . . .	....
Millerton	Frank A. Hotchkiss	6
Mineola	William McCarthy	8
Mohawk	E. M. Plastridge	13
Monroe	F. B. Brooks . . . . .	....
Montgomery	E. Ross Elliott . . . . .	....
Monticello	A. M. Scriber	13
Montour Falls . . . . .	.....	....
Moers	R. J. McDowell	7
Moravia	Dr. Chas. Atwood	11
Morris	E. E. Carpenter	8
Morristown	Frank Gilday	5
Morrisville	Frank D. Babcock	5
Mt. Kisco	Charles S. Ware	10
Mt. Morris	Dr. F. B. Dodge	14
Naples	F. W. James	10
Nassau . . . . .	.....	....
Nelliston . . . . .	.....	....
Nelsonville	Harvey C. Hustis	3
Newark	Geo. A. Burnham	24
Newark Valley	Austin Dickerson	9
New Berlin	Horatio P. Ball	8
Newfield	Wm. Weatherell	5
New Hartford	Geo. C. Hodges . . . . .	....
New Paltz . . . . .	.....	....
Newport	Benj. L. Ford	6
Nichols	S. H. Latham	5
North Olean	Geo. M. Lundy	15
North Pelham	James F. Secor . . . . .	....
Northport	Rowland Miles	13
North Tarrytown	Millard M. DeWitt	15
Northville	E. G. Palmer	7
Norwich	Geo. W. Ray	35
Norwood	Willis J. Fletcher	12
Nunda	John A. Dade	9
Nyack	Eugene F. Perry	28
Oakfield	A. T. Heckroth	7
Odessa . . . . .	.....	....

<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Oneida Castle	A. S. Galbraith	7
Oneonta	Albert Morris	24
Oramel, sent to town health office	No board of health	5
Oriskany Falls	F. D. Curtis	40
Ossining	Paul M. Pierson	6
Otego	Jerome Ceperley	7
Ovid	Benjamin Franklin	26
Owego	H. Austin Clark	13
Oxford	Jared O. Estelow	7
Painted Post	A. D. Hatch	4
Palatine Bridge	Augustus M. Hodge	5
Palmyra	Edwin B. Anderson	33
Panama	W. L. Eddy	6
Parish	F. B. Foote	25
Patchogue	Geo. D. Gerard	James F. Secor
Pawling	Geo. A. Daniels	23
Peekskill	Leverett F. Crumb	18
Pelham	James F. Secor	11
Pelham Manor	John H. Johnson	7
Penn Yan	Charles Wise	9
Perry	F. H. Wisewell	13
Phelps	W. T. Scofield	13
Philadelphia	John L. Crandell	5
Philmont	Henry S. Van Wormer	8
Phoenix	George M. Williamson	11
Piermont	George M. Williamson	8
Pike	F. H. Lyon	11
Pine Hill	Rev. G. H. Gomp	11
Pittsford	Charles D. Hoyt	5
Pleasant Valley	Milton Howe	9
Pleasantville	R. R. Stilwell	49
Poland	John W. Diehl	12
Port Byron	C. B. Warner	48
Port Chester	William A. Parshall	6
Port Dickinson	Friend Hoyt	5
Port Henry	W. E. Wheeler	7
Port Jervis	F. L. Cubley	12
Port Leyden	William G. Dean	7
Portville	D. C. Mahaffy	7
Potadam	J. A. Crowley	5
Prattsburg	C. O. Peterson	5
Prospect	Theodore F. Cookingham	5
Pulaski	Edward E. Samuel	8
Randolph	Lee Van Vredenburgh	5
Red Creek	Levi Hardman	13
Red Hook	John D. Cary	5
Remsen	M. W. Harroway	4
Rhinebeck	F. B. Beaman	6
Richburg	Frank T. DeLano	5
Richfield Springs	John R. Myers	5
Richmondville	M. W. Fisher	19
Richville	Theodore Fremd	6
Rifton	John Roblin	17
Rockville Center	Charles E. Wells, M.D.	
Rosendale		
Rouses Point		
Rushville		
Rye		
Sackett Harbor		
Sag Harbor		

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<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
St. Johnsville	Joseph H. Reaney	12
St. Regis Falls, town of Waverly. No board	M. B. Ramsdell	10
Salamanca	W. K. Harrison	28
Salem	Wm. J. Cruikshank	8
Sandy Creek	Melvin D. Herriman	10
Sandy Hill	Marcus C. Allen	31
Saranac Lake	Isaiah Vosburgh	10
Saratoga Springs	William H. Bennett	17
Saugerties	R. B. Overbagh	9
Savannah	C. A. Coleman	6
Savona	T. C. Wall	7
Schaghticoke	Geo. W. Baldwin	9
Schenevus	M. E. Baldwin	8
Schoharie	Chas. M. Throop	10
Schuylerville	Amos B. Jaquith	15
Scotia	J. L. Hamblet	10
Sea Cliff	Russell Sturgis, 2d	27
Seneca Falls	Jasper N. Hammond	6
Sharon Springs	F. W. La Rue	9
Sherburne	John H. O'Brian	9
Sherman	I. O. Ottaway	7
Sherman Park, to town of Mt. Pleas- ant, Westchester county	Oliver S. Titus	14
Shortsville	Geo. F. Cosgrave	17
Sidney	J. J. Dalrymple	7
Silver Creek	W. B. Powell	6
Silver Springs	A. C. Andrews	12
Sinclairville	F. H. Gregory	7
Skaneateles	Wm. F. Meadway	37
Sloan	Geo. P. Pudney	14
Smyrna	Geo. J. Schottle	11
Solvay	Walter L. Jagger	7
Southampton	H. B. Parks	8
South Glens Falls	M. D. Fisher	17
South Nyack	Dr. L. E. Slayton	17
Spencer	A. H. Goodhart	11
Spencerport	Frank O. Smith	7
Spring Valley	Chas. L. Andrus	15
Springville	Geo. B. Lawrence	4
Stamford	R. G. Riggs	30
Stillwater	Chas. L. Thorpe	6
Stillwater	Frank R. Pierson	23
Stillwater	Patrick Kelley	5
Stillwater	Frank B. Wickes	9
Stillwater	Henry Miller	7
Stillwater	Ossian G. Noble	4
Stillwater	J. T. Crofoot	10
Stillwater	Lawrence C. Maid	14
Stillwater	Geo. W. Allen	7
Stillwater	Chas. C. Flaesch	7
Stillwater	G. F. Sleter	7
Stillwater	Harriet L. Farley	7
Stillwater	Nathan P. Wild	7

<i>Name of Incorporated Village.</i>	<i>President Board of Education.</i>	<i>Number of teachers.</i>
Valley Falls	Dr. T. C. Church.....	7
Van Etten	B. U. Osborne.....	5
Vernon	Dr. G. M. Lewis.....	7
Victor	C. H. Merrill.....	8
Victory Mills .....	.....	.....
Voorheesville .....	.....	.....
Waddington	B. S. Crapser.....	6
Walden	Sanford Abrams	18
Walton	Dr. Wm. B. Morrow.....	20
Wappingers Falls	Daniel Ashworth	8
Warsaw	John Harrigan	18
Warwick	J. H. Wood.....	13
Washingtonville	Wm. H. Hallock.....	.....
Waterford	J. Wm. Atkinson.....	25
Waterloo	Frederick L. Manning.....	22
Waterville	I. D. Brainard.....	13
Watkins	O. P. Hurd	14
Waverly	Willard M. Hilton.....	26
Wayland	W. W. Clark.....	9
Webster	Thomas Nagle	11
Weedsport	Chas. S. Caywood.....	10
Wellsburg	Chas. L. Streight.....	.....
Wellsville	W. J. Richardson.....	.....
West Carthage	Reuben Chaufy	8
Westfield	A. B. Ottaway .....	.....
West Haverstraw	John Oldfield	6
West Salamanca .....	.....	.....
West Winfield	J. H. Stephens, M.D.....	8
Whitehall	Nathan E. Foote .....	.....
White Plains	Edward B. Long	60
Whitesboro	N. G. Waterbury
Whitney's Point	Amos M. Johnson.....	7
Williamsville	N. B. Long.....	8
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Windsor	Adrian M. Keyes	6
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FRIDAY, OCTOBER 18, 1907

SEVENTH SESSION, 8 P. M.

SYMPOSIUM ON PURE MILK—WHAT HEALTH DEPARTMENTS CAN DO TO SECURE PURE MILK

DR. LESEUR OF BATAVIA (presiding)

I. BY INSPECTION OF DAIRIES AND FARMS

THOMAS DARLINGTON, M.D.

Health Commissioner of the City of New York

The problem of a pure milk supply for a city is solved when the Department of Health can guarantee that all milk sold within the city limits is drawn from perfectly healthy and normal cows, housed in comfortable and sanitary quarters, milked by a clean and healthy person into a sterile container, quickly cooled, transported and delivered to the consumer in a sealed package.

As the major portion of such a guarantee concerns the health of the cow and the milker, and the sanitary condition of the stable and utensils, the proper place to begin corrective work is at the source, "The Dairy Farm."

From the time when each family kept its own cow or depended for its supply of milk on a local farmer, to the present period, when the big cities depend upon a supply drawn from thousands of dairies scattered over wide areas, is a far cry. This change has come about so insidiously and cities have grown with such astonishing rapidity that it is only recently that the public has awakened to the importance of this vital problem.

The milk supply of New York city consists of 1,750,000 quarts of milk daily, which is gathered from over 35,000 farms and shipped from about 700 creameries, located in six different States.

This great quantity of milk is produced in various sections with a corresponding variety of methods of production. The fact that the farms lay in six States precludes the possibility of uniform supervision by the various local governments.

It is, of course, understood that the Department of Health has no authority outside of the geographical limits of the city, but our sanitary code provides that "No milk shall be received, held, kept, offered for sale or delivered in the city of New York without a permit from the board of health," and the board can withhold or rescind this permit if unsanitary conditions exist at the dairy or creamery where the milk is produced or handled.

New York city has, therefore, the right to say what pure milk shall be and to forbid entrance to the city of any milk not produced with the proper attention to cleanliness, hygiene and sanitation.

It has been the endeavor of the Department of Health to establish and maintain these conditions as regards the milk supply of New York city; first, by systematic and constant inspection; and second, by preventing the sale of any milk not produced under clean and wholesome conditions.

Rules and regulations for the productions of sanitary milk were issued, and the Country Division of Milk Inspection, consisting of sixteen inspectors, with one inspector in charge, is now in the second year of its work of dairy inspection.

For two years prior to this two experienced inspectors investigated the conditions surrounding the production of our city's milk and brought to light the vast number of abuses that prevented a clean and unpolluted supply. They made preliminary inspections in various creameries, skimming stations and cheese factories that sent their entire or surplus milk or cream to New York. With the establishment of our present dairy division, rules and regulations were sent to every dairyman supplying New York, systematic inspection was inaugurated and the work, steadily advancing, has increased in effectiveness and importance.

A majority of our city milk dealers now incorporate our rules and regulations in the contract they make with the farmers for their milk. Tenants on farms now discuss with the owner before renting what must be done to keep the premises in a sanitary condition, satisfactory to the Department of Health.

During the early part of this work many extremely unsanitary conditions were found. The situation in some instances was beyond hope of correction. A few dairies were closed as the improvements recommended amounted practically to an entire rebuilding of the dairy. No amount of pasteurization could ever make milk produced amid such surroundings fit for human con-

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sumption. In fact, pasteurization cannot atone for filth. Preventative measures are better than corrective ones, and whatever opinion may be held as to the relative necessity of pasteurization, the essential feature of a pure milk supply is that the milk be produced under clean conditions, and that it be kept clean.

The fact that the farmers are without a market for their milk unless they comply with the rules of the Department has been a potent factor in causing them to comply with our orders. The creameries are practically all conforming to our regulations and the dairies and farms are being rapidly put into a sanitary condition.

You have heard considerable of the hardships we are thrusting on the farmer; you have heard of the small producers we are driving out of business, but you will be surprised to learn that out of 35,000 dairies we have been forced to shut out milk from only forty-seven places, and from these for only a short period or until they have changed or improved the condition of their premises.

Our requirements can be summed up in one word, "cleanliness," to comply with which is not necessarily impossible or expensive. Our rules concerning the cows provide that they must be kept clean and that the manure must not be permitted to collect upon the tail, sides, udder and belly. These rules to the clean dairyman would be recognized as essential, but to the filthy dairyman an impossibility and a hardship.

The rules for stables provide that they must have sufficient light and ventilation; floors, walls and ceilings must be clean and tight, the interior whitewashed yearly, and all manure must be removed daily. In the light of investigations, these are necessary to the production of clean milk and can be provided at nominal cost. The removal and immediate utilization of the manure alone would help pay the cost of these changes, and no longer will the huge piles of manure be allowed to accumulate, a menace to good milk and a direct loss to the farmer in the wasted fertilization of the cowyard.

We insist that the water supply must be pure. No dairyman should be allowed to use a supply that is otherwise. Our inspectors have sent in thousands of water samples. The analysis and condemnation of impure supplies have been a lasting benefit to the dairyman in our milk shed and to the milk supply in general.

Our rules provide for a milkhouse to be used exclusively for the handling and storage of milk. This discourages the old practice of straining and keeping the milk in the cow barn where formerly it received its full share of odors, dust and dirt.

Our rules provide that no person having any communicable disease or caring for persons having such disease be allowed to handle the milk or milk utensils, and the hands of the milkers must be carefully washed immediately before milking. How idle to discuss these as hardships when the most elementary knowledge on the part of the dairyman should alone prompt these precautions.

Utensils must be thoroughly cleaned immediately after using and the rinsing of the milk pails in the watering trough will neither suffice nor be tolerated.

Our rules concerning milk provide that it must be free from preservatives and adulterations, it must be quickly cooled to 50 degree F., and must not be drawn from diseased cows.

The matter of testing every herd with the State is primarily a State function. The State should establish a quarantine and prohibit infected cattle from coming into the State; it should test every cow within its borders, should condemn and destroy all diseased cattle and reimburse the owner.

A copy of our Dairy Rules, printed on linen, is posted in over 30,000 cow barns in our milk shed. These rules are encouraging a uniform production and are making filthy and unclean methods the exception. With the dairy rules posted, the next step is to see that they are enforced.

Our sixteen inspectors are each assigned to a district through which they move in a systematic way. They first inspect a creamery and ascertain its sanitary condition; they then inspect all dairies drawing to that station before passing to the next. Each inspection is complete in itself and all of the information obtained is tabulated on cards and mailed to the office in New York. The inspectors average ten inspections a day and with our present force, we cover the entire milk shed once a year.

To qualify men for this work was admittedly a hard task. Dairy inspectors must have a liking for the problem of the farm and must be qualified to give helping suggestions to the dairyman when necessary. A civil service examination excludes those without technical or practical knowledge of the work; then by a course of instruction by experienced inspectors, we have secured a corps

of men whose qualifications and judgment fit them for their duties.

One peculiarity of our problem is worth mentioning at this time. Heretofore dairy inspection work was performed largely for the purpose of information and scoring was done in a general way. The department of health of the city of New York in its new work had the specific duty confronting it of stating plainly to the dairyman what sanitary defects were found, and to plainly outline to him what improvements were essential to render his scoring perfect and his premises sanitary.

To that end we adopted our present score card, with its definite statements, its seventy-five distinct items and its minute and careful scoring. When these reports are sent in, we prepare a letter which we send direct to the farmer, stating what his dairy scores and what improvements are recommended by the inspector.

The effectiveness of this system of dairy inspection is now being proved. Where reinspections have been made we have found uniform improvement. Whitewashing has invariably been done. Window lights and additional ventilation have been installed, milkhouses built, huge piles of manure carted away and the cows groomed and properly cared for. We have caused thousands of privies to be removed to a greater distance from the well, for the habit of farmers to install these two as dangerous neighbors is well known.

Our new requirement that all cases of infectious disease occurring in the households of the dairymen or his help must be reported to us at once has had an educational effect upon the farmer and has made him realize how he can help prevent the spread of milk-borne diseases.

Early in this year, an important addition was made to the sanitary code of the Board of Health. It provides that:

"It shall be the duty of all persons having in their possession bottles, cans or other receptacles containing milk or cream, which are used in the transportation and delivery of milk or cream, to clean or cause to be cleaned immediately upon emptying, and no person shall use or cause or allow to be used any such receptacle for any purpose whatsoever other than the holding of milk or cream, or receive or have in his possession any such receptacle so used or which is unclean or in which milk or cream has been allowed to stand until offensive." This section is simply in line with our constant efforts toward ultimate perfection. And I

might say in regard to this section that only last Monday in New York a large number of dealers were fined in the Court of Special Sessions under this one provision alone — the lack of cleanliness of cans and dippers.

The co-operation of the State concerning the cleaning of utensils in which milk is shipped is encouraging. Our inspectors have witnessed, upon a farm from which the milk is shipped direct, cans returned in such a condition that the farmer and his wife at first sight would flatly refuse to clean them. Sooner or later those cans would be used, and as the means of thoroughly cleaning them on the farm is limited, we can imagine the condition in which they were refilled and shipped back to the city.

Probably the last and best word that has been said on the subject of the control of the milk supply is that embodied in the report of the commission appointed by his Honor, George B. McClellan, mayor of New York city, to study and report on the best methods of milk inspection and control. Several of their conclusions are as follows:

First. That milk obtained from a healthy cow is always wholesome, and never a source of danger if it is kept cool and uncontaminated.

Second. In regard to tuberculosis, the report states that the risk of transmitting tuberculosis through milk from cows to man is very slight, unless the disease in the cow is in an advanced form, or is present in the udder. Then this slight risk is considerably lessened when such milk is mixed, as it generally is, with that of healthy cows before it is sold. We believe that this danger has been greatly overestimated in the public mind, and that it can best be met by systematic inspection and condemnation of cows revealing tuberculosis on physical examination.

Third. To secure a good milk supply it is of the first importance to educate the farmers regarding the measures which alone make this result possible, and afterward to see that the rules relating thereto are carried out, since for the most part the contaminating agents which render milk dangerous are introduced at the farms. The production of good milk demands that the farmers be educated so as to secure this result, and also that the proper surveillance be exercised.

Since the system of inspection has been in force, the milk supply in New York city has been materially improved. Granting the premise that I have taken that the function and responsibility

of a municipality can be only to furnish to the citizens a supply of pure milk, then the question is simply one of expansion and possibly elaboration of detail. The main and fundamental facts are perfectly clear. Systematic inspection is an absolute necessity, and the maintenance of absolute cleanliness is a *sine qua non*.

II. BY THE PERMIT AND LICENSE SYSTEM

ERNEST WENDE, M.D.

Health Commissioner of Buffalo, N. Y.

No article of food involves greater possibilities of danger to health than milk. It has been the medium of disseminating contagion time and again; of creating a monstrous infant mortality; and the fact is accepted, after ample experimental and pathological investigation, that it is a source of transmitting bovine tuberculosis, particularly in early life.

This, and the fact that milk, with the possible exception of wheat, is the food most universally used, and that it is peculiarly subject to infection, being a culture medium of high order, has necessitated the closest scrutiny and supervision to guard against the possibilities incident to it.

Notwithstanding, safe, pure milk is not yet a general reality, and many features connected with its production are unsatisfactory and dangerous.

A survey of the situation, as it is to-day, shows a condition presenting opportunities for contamination at every step, from production to consumption, but principally at the source where faults, once created, irrevocably remain throughout, entailing, in consequence, an elaborate system of supervision, always open to criticism.

It is pertinent, therefore, to refer briefly to the conditions which contaminate, indicate the lines of improvement and point out the best methods of securing them.

These remarks specially relate to the industry in this section, but indicate a condition which, with minor differences, prevails generally in cities of this class.

Dairies may be arbitrarily classified into three grades.

There are, in this State, a certain number of dairies that fulfill the highest requirements of sanitation, are conducted with a

full understanding of the business, and a proper appreciation of its possibilities, and whose sole aim is the production of milk of the purest and best quality. They stand alone, are models of their kind, and some, if not yet commercially successful, are educational and encouraging.

There are others, and a large number, of a second grade, with which the production of milk is either the sole or most prominent feature, and which, while not fulfilling the standard, recognize the deleterious possibilities and maintain a degree of care and cleanliness that is commendatory.

There remains a third large class, the number of farmers with whom milk is but one of their outputs, and whose sanitation and methods are far from good, frequently bad, to which sanitation does not appeal, which will not obey, and to which the cost of betterment is not justified, and which, even if it were, would not make it. These latter producers are an ever-present menace and danger.

In general, in proportion as the business is the sole production of milk and the herds are large, conditions are better.

The features at the dairy which cause contamination are these:

That animals are not tested, periodically examined or groomed, or provided with suitable environments, or properly milked.

Clean milk cannot be had from dirty animals or from animals cared for in the midst of unsanitary surroundings, dark, dusty, ill-ventilated barns. In the latter — and there are too many of them — dust and dried excreta abounds, while the beasts, themselves contaminated, disseminate contagion with every movement during the milking. So, that from conditions possible with the animals and from their environment, the product, at its very inception, is infected. The subsequent course of the milk subjects it still further to contamination. The farmer's idea of cleanliness not being that of the sanitarian, the cans and utensils, the cooling process and the general procedure all continue the infection.

From the dairy the milk is hauled to the station — one farmer frequently acting as collector for many, or even taking small outputs and mixing them with his own, thus losing the identity of the several products and surely resulting in contamination. After varying periods at station, with exposure to all kinds of weather, in cans open to criticism, it is hauled by rail, without refrigeration, to the city of Buffalo, where it is turned over to

the retailer upon whom its future condition depends. He receives the milk within twenty-four hours, at an average temperature of about 50° F., and proceeds to prepare it for the trade, all which involves air and other exposure, manipulation, etc., with accompanying risk.

There are about 400 milk dealers in the city of Buffalo handling approximately 34,000 gallons of milk daily.

The conventional duty of the retail dealer principally consists in removing a certain amount of cream by separator and bottling.

His further duty is to keep the milk refrigerated; to maintain a sanitary condition of milkhouse and cooler; to have scrupulously clean utensils; to follow a system of bottle cleaning that is safe and thorough, and to live up to the city ordinances, especially those relating to contagious disease and adulteration.

In each and every detail a slip may occur, through carelessness or evasion or by intent, with undesirable consequences.

The responsibility of policing the business and protecting the public is placed by the State upon the Department of Agriculture, the city additionally surrounding itself with such safeguards as the situation demands. Owing to the inefficiency of the former the latter has to guard not only against possibilities within its own borders, but from those beyond its jurisdiction.

The State supervision is open to criticism. It is inefficient in that there is no systematic inspection, and that what irregular work is done in this line is upon complaint or hearsay. Even when initial it proves secondary to other work when one area is looked over at a time.

As the city of Buffalo is supplied from many hundreds, if not a thousand, sources, not less than 500 of them being in the ninth district, comprising Erie, Niagara and Orleans counties, the State's surveillance is practically farcical.

Many dairies have never been seen or inspected by the State authorities.

With the exception of instances of contagious disease in animals, where quarantine can be established, there is no procedure for closing an offending dairy without a ten days' notice, during which time milk can continue to be produced and shipped. In these circumstances it is only through co-operation of the city authorities in interdicting the milk that the danger resulting from its possible use is averted.

Examinations of milk are not made as to their bearing upon health, but merely as to its commercial standard.

During the past year only thirty-five samples were examined from the country, of which eleven were fined — 33 per cent. If this percentage of commercial fraud was perpetrated, what attitude would these delinquents be likely to maintain toward cleanliness, particularly if it implied cost, and in the absence of inspection?

Further, no uniform standard is required at the dairies; instead of their coming up to a standard requirement of sanitation and equipment, sanitation is applied to all sorts of equipment and conditions with obvious unsatisfactory results.

The city protects itself in maintaining a record with detailed data of the various supplying dairies — by inspection and by arbitrary interdiction of unsatisfactory milk, from whatever cause, and upon suspicion, pending investigation as to specific gravity, temperature and the like.

It causes examinations to be made on arrival and samples taken for bacterial count. Milkhouses are scrutinized daily as to every particular of sanitation, procedure and bottle washing, and surveillance is exercised over street peddling and house delivery as well as grocery dealers.

An itemized system of recording contagious disease, in connection with each individual milk route, by means of the "tell-tale" register, which is scrutinized daily, shows when any particular route has contagious disease upon it beyond a particular number; the milkman's business is at once investigated and its etiological conditions localized.

Another writer will speak of the epidemics that have been checked in their incipency through this system.

The bacterial count is the index for official action.

When above 500,000 per cubic centimeter, investigation is instigated.

The writer believes a greater security would be obtained and the public best served if the possibilities were centralized, and sanitary effort was there concentrated.

As liability to contamination is greatest at the source of production, and next with the city dealer, it would appear that with a standard dairy, a system that would eliminate deterioration and contamination beyond it, and a quick delivery, the consumer would get the product as near to nature as possible.

To this end, a radical change would or should obtain, and along these lines is the Department's action exerted.

The Department of Agriculture, as at present constituted, being unequal to the situation, the industry should be placed with a State bureau of dairies, under the State Department of Health, with facilities, powers and equipment, technical and administrative, that the situation demands. The field is so enormous and so intimately connected with the public welfare that the State is justified in creating a special control, even though it would necessitate large expenditure.

By such bureau the license system should be adopted. No system of control to prevent injury to the public welfare and further sanitation could be so satisfactory. It has demonstrated its efficiency wherever applied, not only in protecting the public, but furthering and improving the interests themselves. While not a contract, it should be given only in consideration of the fulfillment of certain conditions of the sanitation and methods that our present knowledge has demonstrated to be necessary and efficient. The licensing power should be vested with the enforcing authority, and be revocable without notice or hearing when the conditions it is based upon are violated, which should be specified in the license. Many license enactments necessitate "notice and hearing to show cause why" before revocation, which delays procedure and modifies moral effect. It has been suggested that, if feasible, a small bond should be exacted for faithful observance, which is, however, an open question.

The policy of the State, the intent of the enactment, should be to foster the dairy where milk is the sole product, and minimize and, if possible, gradually eliminate, so far as supplying the city is concerned, those with whom its production is a side issue and where high sanitation is not possible. Incidentally, this would entail no great hardship to the latter, for generally that interest is small — an average of eight to ten cows, which are generally kept for their manure, their product about equalizing their cost of keeping in the winter. With this class, their product could go to the manufacturing industries — butter and cheese — where the manipulation and process modifies contaminating possibilities.

While it is desired that all dairies be uniform, those supplying the city milk might be specialized, and a high standard demanded and be differentiated from the lesser ones where the product goes in other channels. In other words, grade them and direct their product according to their sanitary standard.

The requirements to operate a dairy under the license system should be based upon the following essentials:

1. Tuberculin test, periodical examinations, and sales to dairies, to be accompanied by veterinarian's certificate of condition.

2. Buildings of concrete or impervious construction, troughs and gutters the same, to prevent absorption and permit flushing. A system of ventilation independent of windows, abundant light and proper cubic air space.

3. Grooming, and aseptic precautions for the milker and for the animal, in milking.

4. Modern improved utensils which lessen air exposure.

5. Immediate rapid cooling and emptying into sealed containers for retail consumption.

6. Ice and steam.

7. The adoption of a satisfactory standard container for wholesale shipment, which should be limited to wholesale consumers, such as factories, ice-cream factories, hospitals, hotels and the like.

8. Uniformed, intelligent attendants. An advance would be made if, during the winter, those in the dairy sections could receive, through the State, instruction in dairy sanitation and principle; and those who are qualified in such manner should receive preferment in work and pay. Place the dairy attendant on a plane with skilled, instead of unskilled, labor.

9. Systematic inspection and a system of careful reporting.

10. Use of sealed containers, that the product may be put up at dairy for delivery to retail consumers.

While State control of the industry in the country, under a license system on the lines indicated, is an urgent necessity, it is not to be assumed that in its absence equivalent safety cannot otherwise be attained. Through the permit system, a control can be maintained which, while not as complete or comprehensive, will be likely to bring satisfactory results.

Its essentials are that no dairy can ship into or sell within the city any milk without first obtaining a permit from the municipality.

This should be contingent upon sanitary conditions and modes of procedure satisfactory to the Department of Health. The power to interdict any milk at the city line or to prohibit any milk dairy in the city from receiving milk from any specific source furnishes the necessary means of enforcing municipal requirements.

In these circumstances, the following are required:

Each dairyman supplying the city with milk must obtain a yearly permit, which (as with the State license system) is issued only subsequently upon inspection, and after certain requirements of sanitation and procedure are complied with.

The Department of Health, in addition to having a detailed record of the dairy in all matters pertinent, should maintain a system of official monthly inspectors' reports upon all matters, as may be indicated.

Municipal sanitary officers have no greater ally than the press, so that publicity is their "big stick," since, to the possible delinquent or offender, the fear of it is more dreaded than fines. With this in mind, the periodical publication of the rating of the dairies and city milkhouses for public enlightenment is advisable. This feature can be most admirably utilized in relation to the sanitation of *all* industries depending upon public patronage, especially foods, and their preparation.

Much of the care and protection given milk in its passage to the consumer is neutralized by the conditions to which it is subject after reaching the consumer. This being beyond the direct control of official action, the possibilities can only be met by education, by the diffusion of knowledge among the masses, of all grades, as to the sanitary care of milk and the untoward results of negligence. To this end, I would advocate the labeling of each container in one or more languages, with concise information, the nature of which could be varied, in summer, with special reference to infant and child-feeding. In other words, I would make the paper milk container an educator as well. Reaching, as it would, almost every household, it would daily reiterate the cardinal rules for milk care until they would be indelibly fixed in the mind.

There has been recently introduced the paper paraffine-lined aseptic milk container for single service. The advent of this device eliminates the possibility of the bottle, permits milk to be put up at its source, protects it from contamination in its subsequent course, and tends to simplification of the whole matter. Its general adoption would convert the city milkman from a manipulator to a distributor, and the dairy doing the work for him, the expense of separating, bottling and refrigeration would be eliminated, which, with public enlightenment (and the public has never been so alive to sanitation and the milk question as

now), and appreciation that cheap milk means unclean milk, and an advanced price, would increase his profits.

If the mission of the single-service milk container is limited to supplanting the bottle trade as, at present, existing, its advent means much.

The possibility of infection from bottles will continue so long as they are in service, for, while beyond the control of the milkmen and in possession of the consumer, they are frequently used in domestic service for other purposes, clean and otherwise. The Department of Health of Buffalo has had its attention called to their being used in sick-rooms infected by contagious disease, for "ducks" in nursing, and for various other contaminating offices, all of which is beyond the reach of ordinance or inspection. The paper container precludes the possibility here mentioned.

With the large standard dairy preparing the product for consumer, and the milkman a distributor, there remains the transportation feature; for, at the present time, no protection is afforded, other than the open platform, the bare service car, and terminal sheds; so that much of the expense and effort in cooling at the dairy is offset by its subsequent unprotected journey.

A low bacterial retarding temperature is an essential for milk integrity. Cooled to the proper degree and maintained so, pure, good milk will keep until utilized. The proper transportation of milk requires not only refrigerator cars, but cooling facilities at collecting stations where the product frequently has to wait long periods for train arrivals. Therefore, coolers should be maintained and their efficiency and sanitation be under surveillance. Terminal coolers are not so strongly indicated, inasmuch as removal is immediate upon arrival.

It is, however, important that the wagon haul to distributing points be with full protection from the sun, and it is surprising how efficient a small amount of ice, properly placed under canvas coverings can be made. It is not too much to assume that, with the evolution of the greater advances, the lesser ones will materially grow apace, and the creation of a delivery and hauling wagon adapted and equipped to maintain a low temperature will be in evidence.

The transportation and temperature features being defined, it only remains to bring about uniform action with each link in the chain.

In the absence of steam sterilization, which but few milkmen employ, a cleansing for reuse cannot be expected.

Contamination of milk is in evidence from cow to consumer with greatest deleterious possibilities at its source, which, when consummated, are permanent. A stricter supervision must be instituted, and there must be a more rigid enforcement of sanitary laws, if our milk supply is to be materially improved.

The remedy is:

1. Supervision and control by the State, through a special bureau equipped technically and administratively to meet the requirements.

2. The establishment of a dairy standard and the control of the milk industry by the license and permit system.

3. The policy to foster the evolution of the standard grade large individualized producer, and the extinction of the small menacing contributor.

4. Direct preparation of the milk at the dairy for consumers' use, by converting it into a prepared and not a mere producer.

5. The adoption of refrigerator cars for milk transportation, and cooling sheds at stations.

6. Conversion of the city milk dealer from a manipulator to a distributor.

7. The abolition of the existing milk cans and bottles, and the adoption of the single-service paper container for direct consumption from udder to mouth, from teat to tongue. Make the container an educator as well by labeling it with pertinent facts. The diffusion of knowledge through this channel will bring enlightenment and create the sentiment most necessary to improvement.

No modern pasteurized, sterilized, or certified milk can compete with the raw milk from a healthy udder. It has no possible substitute.

This close tie between cow and consumer must not be severed by manipulations that are deleterious, and by cans and bottles that are unsanitary. The study of a wholesome milk is the study of nature, which is ever ready to repair an injury or furnish a remedy, if we will but heed her teachings.

Therefore, in conclusion, I wish to emphasize that "in our attempts to aid and imitate nature, common sense will establish limitations and keep us away from gross scientific errors."

III. BY THE "TELLTALE" MILK REGISTER

HENRY R. HOPKINS, M.D.

Buffalo, N. Y.

What is the milk register and why is it used? The milk register is a clever device for making effective our knowledge, practical and demonstrative, of the frequently fatal facility of milkman's milk becoming the means of transmitting disease.

The milk register presumes that in a given place there has already been found sufficient intelligence upon the part of the law and ordinance-making bodies to provide for the licensing of the milkman, and further assumes that this power of license is honestly and intelligently administered by the health officer of the place. We will further assume that in this place under consideration there are health ordinances and that these ordinances require at the hands of those persons accustomed to treat the sick, the important public duty of promptly reporting to the health authorities all cases of diseases known to be communicable.

Only under these conditions is the milk register possible, and with these conditions assumed as present, we will proceed to introduce the milk register. This device includes a register of the name of each person licensed to sell milk, and these names are placed in a large book like the accountant's ledger, the name standing at the top of the page. The entries, the debits, subsequently made to these several accounts, are made from day to day upon the reports of the doctors announcing that in a given house, upon a given street, there was discovered by the doctor at a given date, a case of typhoid fever, of diphtheria, or of scarlet fever, and that the milk supply of the family was furnished by John Doe.

The interesting work of the milk register begins when upon a single day it is found that John Doe has placed to his discredit much more than his due and proper proportion of one of the above-named diseases — and this work rises to intense and tragic interest when the milk register shows that the two or three items of the first day are followed by four or five like items on the second day — for then as early as the second day the work of the milk register is done, warning has been given, the alarm has been sounded that upon the milk route of the said John Doe there is an incipient epidemic of milk-borne disease.

When, where and by whom was the milk register first used? To the best of my knowledge and belief the milk register is the sole invention of that competent and well experienced health officer, Dr. Ernest Wende, most fortunately now and for many years commissioner of health of the city of Buffalo, and was first in use in the office of the board of health of our city in the year 1893.

Epidemics of milk-borne diseases reported by the Buffalo Milk Register:

	Cases.
1893, scarlet fever	10
1894, typhoid fever	10
1895, typhoid fever	5
1896, typhoid fever	7
1898, typhoid fever	5
1899, scarlet fever	33
1901, scarlet fever	13
1901, scarlet fever	10
1901, typhoid fever	21
1904, scarlet fever	10
1904, scarlet fever	14
1904, typhoid fever	21
1907, scarlet fever	17
Total epidemics	13
Total cases of disease	176

When had sanitarians the first practical knowledge of the fact of milk-borne diseases? Like most of the real knowledge of the world, our knowledge of milk-borne disease has been of slow growth. Dr. Michael Taylor, in 1857, reported an epidemic of milk-borne typhoid fever and, in 1867, an epidemic of milk-borne scarlet fever. MacNamara, in 1892, traced an outbreak of cholera at Calcutta to an infected dairy. Jacob, in 1877, reported an epidemic of milk-borne diphtheria at Sutton, England.

Mr. E. Hart, editor of the *British Medical Journal*, reported to the International Medical Congress at London, 1881, the following epidemics of milk-borne diseases: Typhoid fever, 50 outbreaks; scarlet fever, 15; diphtheria, 7; total number of persons involved in these several epidemics, 4,800. Hart, in the *British Medical Journal*, May, 1897, gave additional histories of instances of milk-borne disease, since his report of 1881. Epidemics of scarlet fever, 32; diphtheria, 15; typhoid fever, 48.

Kober at the International Medical Congress, at Paris, 1900, reported 330 outbreaks of milk-borne infections, namely: Ty-

phoid fever, 195; scarlet fever, 99; diphtheria, 36. These were from the following authorities: English, 243; American, 52; German, 14; Scandinavian, 11; French, 5; Austrian, 5. The English and the Americans use raw milk; on the continent milk is rarely used without being boiled.

When and why did our knowledge of milk-borne disease become demonstrable knowledge?

- In the year 1882, when Koch made himself immortal by his demonstration of the existence of the tubercle bacillus, of its causative relation to consumption, of the possibility of its cultivation in a culture medium, and of its ability to cause consumption when administered in an efficient dose from such culture medium. Our demonstrated scientific knowledge of bacteriology contains at least three facts of enormous practical significance:

1. That many and possibly all of our transmissible diseases are caused by pathogenic microorganisms.

2. That these pathogenic microorganisms or many of them may be cultivated in various media, mixtures of water and albuminate matter closely resembling milkman's milk in distinct pathogenic virulence.

3. That many diseases can be caused by administering a suitable dose of the pathogenic organism of these diseases or of any of them from the infected culture medium.

What diseases are known to be transmitted by milk, by water, by milkman's milk? For our knowledge upon this important question we are as usual indebted to the art of medicine and also to the science of medicine. From these two sources we learn that the following diseases are transmitted by milk or by water or by the milk of the milkman, namely: Typhoid fever, cholera, dysentery, tuberculosis, diphtheria, anthrax, glanders and scarlet fever.

What diseases are possibly carried by and transmitted by the milk of the milkman? From the same sources as above-mentioned we learn that the possibilities of milkman's milk includes in addition to the before-named diseases, the following: Pneumonia, cerebro-spinal fever, madura foot, measles, malaria, relapsing fever, gonorrhoea and syphilis.

What is our death rate from the diseases known to be transmitted by milkman's milk? The average annual death rate for the decade ending 1902, in the State of New York, for the diseases known to be transmitted by milkman's milk, was as follows: Typhoid fever, 1,635; scarlet fever, 1,020; consumption, 13,125; diphtheria, 4,085.

What is our death rate from the diseases which may possibly be transmitted by milkman's milk? In making answer to this question I shall try to speak from the mental attitude of the hygienist, who considers the work of the health officer the most important work that mortal man is ever called upon to perform, also that attaching to the position of the said health officer is the responsibility as solemn and as awful as was ever laid upon the shoulders of a human being. This duty and this responsibility requires of the health officer the constant exercise of all known and of all possibly known means for the prevention of disease. That his principle of official conduct must be that it is better to take many unnecessary precautions to prevent disease rather than to fail to take one possibly effective precaution.

With this explanation, let us look at the average annual death rates of the decade ending 1902, and let us put into the list all of the causes of death where there is a probability or even a possibility of impure or infected milk acting to produce morbidity or mortality. We will then note:

Deaths under five years of age	37,970
Cerebro-spinal meningitis	585
Malaria	360
Smallpox	155
Measles	925
Whooping cough	1,000
Diarrhœa	8,570
Acute respiratory diseases	17,500
Total deaths from diseases known to be transmitted by milkman's milk	19,845
Total number of deaths — the argument in favor of the importance and need of the milk register.....	85,930

The average annual deaths of the diseases named in the State of New York during the decade ending 1902.

Which of you have had epidemics of any of the above-named diseases within the jurisdiction where you are responsible for the prevention of the preventable diseases? Which of you can say that not one epidemic of milk-borne disease has existed in your jurisdiction since 1882?

When, and why, and how, are typhoid fever, scarlet fever and diphtheria transmitted by milkman's milk?

The family likeness of these epidemics is most striking. The infection comes from a failure to isolate the sick during the period of their illness in which the disease is communicable, and the slightly ill, the convalescents, the desquamating, those caring for the sick, milk the cows or care for the milk, as the milk is stored in rooms near to the sick; or water infected with the disease is used to clean the milk vessels, or to dilute the milk and the milk becomes infected, and the infection thrives and increases in the milk, and milk being a food intended for immediate use, carries with remarkable certainty the disease from its origin in the dairy to the consumer in the far-away city or town. Hart's work led to the passage of the dairies, cow sheds and milk shops' order of the English Local Government Board of 1885, possibly the pioneer milk ordinance.

Typhoid infection reaches milk by percolation through soil to a water supply, a well or a spring or a reservoir or a stream from cows feeding or wading in sewage-polluted pastures; from dairy hands having the disease, or acting as nurses to those so afflicted; from using the same cloths to bathe patients and to clean milk cans; from persons engaged in handling night soil, and from being stored under the same roof with one ill with the disease — in fact, when the disease exists at the farm or dairy.

Scarlet fever infection reaches milk when the disease is at the farm or the dairy; when those milking or handling milk visit a house having the disease; when milk bottles are taken from houses having the disease; when those having the disease care for the cows, milk the cows, or care for the milk, handle the milk or come near the milk; when the milk is stored near the room of one suffering from the disease; when the milk is aerated, as in the Briggs epidemic, under the roof of a house having one ill with the disease; when those who nurse the sick, milk the cows or handle the milk; when infected cloths or clothing come near the milk; when the cows suffer from streptococic or staphylococic infection.

Diphtheria infection reaches milk, when the disease is at the farm or the dairy; when those ill with the disease milk the cows or handle the milk; when the cows suffer from pyogenic infection, particularly of the udder or teats; or from foot and mouth disease.

Why should there be in the State of New York a milk register in every town where there is a milkman? Because of the uni-

formity of nature in physics, in chemistry, in biology, in physiology, in pathogenesis, in epidemiology. Because many of our most destructive diseases — the diseases which ravage our homes continuously and most distressingly — are known to be transmitted by the milk of the milkman. Because in almost every country of the civilized world epidemics of these diseases have been traced to infected milk. Because these same epidemics of milk-borne disease have ravaged the trusting and helpless people of our fair State, and this the milk register would demonstrate if it was in use. Because every principle of efficiency, every requirement of duty, every obligation of responsibility demands of those charged with guarding and protecting the public health that they be keen, and watchful, and quick, to discover epidemic disease; that they be in haste with preventive measures; that they run to the scene of every epidemic of milk-borne disease just as an efficient fire department turns out quickly and races in haste to the alarm of fire. Because that which the fire so fiercely and so ruthlessly destroys man did build, and man can rebuild again, but that which the fatal epidemic destroys is more valuable than palaces of granite and marble, human life, which once lost man is unable to replace.

What information upon the subject of milk-borne disease is overdue from the workers in our laboratories? What infections and toxins may develop in milk and what rôle do these play in pathogenesis? What are the possibilities of the infections or toxins of milk being found in cream, butter, buttermilk, curd, whey, cheese and sour milk? What relation have agitation, carriage or aviation of milk to its possibility of infection? What relation has the temperature of milk to the possibility of its infection?

How rapid is the rate of the propagation in milk of its various infections and toxins? What is the minimum toxic dose of the different milk-borne infections? How long do the various infections and the resulting toxins persist in pure milk, or in milkman's milk?

What is the resistance of the various infections and the resulting toxins of milk to lactic acid fermentation?

IV. BY EDUCATIONAL MEASURES

GEORGE W. GOLER, M.D.

Health Commissioner of Rochester

Early, very early in the morning, and again late in the afternoon, in thousands of barns in this and other States, thousands of milch cattle are milked every day in the year in order to supply the millions of people in New York State with milk. Of these millions of people 1,000,000 are children under five years of age. In round numbers, down in New York, nearly half a million. Here, in Buffalo, 50,000; in Rochester, 20,000; in Syracuse, 10,000 babies under five years of age, all dependent upon milk for food. A million babies; 9,000,000 people; some of them sick, must have this milk produced daily from the bodies of all these thousands of animals.

From these statements one would be led to think that the education and training of those intrusted with the production, transportation and distribution of milk would be made the subject of the State's greatest care. For are we not taught that the State depends upon the physical, mental and moral welfare of its children for the perpetuation of the Nation?

Do we see evidences of that care that milk demands by either the producer or the retailer? Does the producer handle his milk carefully, properly care for his utensils, store and transport it carefully, protect it at the railroad depots and provide for icing it on trains? Does the producer or the retailer clean his cans or utensils as they ought to be cleaned? Does he keep milk cold, or does he substitute pasteurizing or preservatives for ice? Is there even provision for determining what percentage of the milch cattle are subject to tuberculosis? What man may enter the business of milk production? Has he training? Does he enter the business of dealer in the most perishable of foods with that education and training which these million of infants have a right to demand for their protection, and which you, the State, should demand for them? They can neither speak nor vote as you men can vote or as both you men and you women can speak.

Inspection of milk and the protection which it should insure are both sadly lacking.

Is there a model farm where the dairyman may see and learn how he ought to produce and handle his product with financial

advantage to himself and sanitary advantage to you? Is there a model dairy where the retailers of milk may learn how best to handle milk and how best to clean and to keep clean milk and milk utensils? The men who work as barbers, the men who cut your corns or bunions, the men who bury your dead must all pass examinations before they can receive licenses to do these things, but the men who produce or who sell milk to the million of babies in the State of New York, are, as a class, without education or training in the simplest rules of cleanliness, and by a mere declaration and on payment at most of a dollar or two may purvey food to your children. With this food millions of organisms are frequently found in every teaspoonful. The germs of tuberculosis, typhoid and diphtheria and the poison of scarlet fever are but too often conveyed from the far away farm or the family of the retailer to the children of the State.

When will you, as a people, awaken to the necessity for clean milk? Not so much because milk may cause the death of many infants, but because of the danger of disease in the years of the child's formative state when the energies of the body should be used for growth, and not for resisting disease carried to it by milk.

In the countries of Europe the subject of milk as food for babies has received much attention within the last decade. Abroad, they have begun to realize that the character of the milk supplied to the babies is of importance because milk is almost the sole food of the baby. They have found, as in Berlin, for instance, where there were more breast-fed children than elsewhere, that in 1895, 45 per cent. of their infants were breast fed, but that in 1905 the number of breast-fed children had diminished to less than 33 per cent. We have in this country to-day, on the authority of special workers in children's diseases, less than 25 per cent. of mothers in affluent circumstances who are able to nurse their children. Other evidence could be adduced to show that the number of naturally suckled children is diminishing, and this being the case, we are compelled to fall back upon the cow, to make our babies parasites upon a four-footed board-faced animal who may furnish food for a calf, but only at the very best, indifferent food for a human baby.

Cows' milk, even chemically, is at best poor food for a human baby. It clots in larger and more indigestible lumps than woman's milk. It has a different fat, albumin and sugar content

than human milk. With all the skill of the most scientific treatment it is both chemically and physiologically unfit for a human baby. Artificial treatment, predigestion, gruel mixtures make it poor indeed in comparison with human milk. The only way to make cows' milk fit for a human baby is to feed it into the digestive tract of the human mother, in whose system it should be elaborated for her baby into human milk droplets from her breasts.

But we have before us the problem of 75 per cent. of our nurslings to be fed by the cow. You know the foul, dark, ill-ventilated, dirty stables, the dirty cows, cans and utensils, the flies, the swarms of bacteria in the artificial food of the baby. You know of the poor makeshifts, the strainers, the temptation to condense, cook and pasteurize and otherwise "ize" this food, and all the time those of us who are striving to teach the value of clean milk are learning the lesson of depopulated France, Germany and other European countries, viz.: that the most precious thing in the world is the human baby. We are learning this lesson, not yet perhaps as they have learned it, because in Europe the mothers bear children, and bearing children attempt to rear them, but here our native American women no longer bear children as they once did, and so as we import raw products of other kinds, we are now beginning to import most of our mothers.

But if we have not a large proportion of native-born children, let us try to keep those we have and all other children alive and well. Let us try to realize that the baby is a future citizen. Let us try to look upon the protection of the milk supply as one of the greatest measures of protection for these citizens. Milk is secondary in importance only to water. All people may and should join in protecting this great food supply. The physician especially may do much to advance this work if he will acquaint his patients with the necessity for procuring clean, cold milk, unchanged by any pasteurizing, or so-called concentrating process, and for protecting that milk by cleanliness and by icing, both before and after it reaches the consumer. The physician can assist in the establishment of milk stations throughout the city. Especially should such stations be established in connection with hospitals, particularly in those hospitals where clinics are held, so that the nurses in charge of the work, and the physicians and students attending the clinics may observe the value of clean

milk in the artificial feeding of infants. It is notorious that hospitals, as a rule, have the worst of milk supplies. It is supposed that their drugs are pure. Do they pay less attention to their milk than to their drugs? A patient becomes sick, the physician puts the patient upon a milk diet. How often does he know whence the milk comes, and whether it is clean or dirty? The importance of milk as food for older sick people is considerable, but of how much greater importance is it when the milk is to become food for infants? The results obtained from systematic milk inspection through the work of milk stations are remarkable, but still more remarkable are the results shown in the figures taken during the last three months in Rochester where all the deaths in infants under one year of age have been investigated with reference to whether the infants were breast fed or artificially fed, and if artificially fed, what was the standard of the milk obtained for their food?

During the months of July, August and September, the months of heaviest infantile mortality, there were 144 deaths in infants under one year of age. Of these (excluding four less than forty-eight hours old) 22 were breast fed, 122 bottle fed and of these 122 bottle-fed children who died during those three months not one of them received a really safe milk supply.

It may be fairly assumed that the breast-fed infants of the alleys have a far greater chance for life than their artificially fed brothers or sisters of the avenues. The children of those parents in affluent circumstances, when artificially fed, have a greater chance for life than the child so fed in the slums, or the carelessly fed child of a higher social grade. Artificially fed infants will thrive better on clean cows' milk in hot weather than on dirty milk in hot weather. They will even do better on home pasteurized or sterilized dirty milk than when fed on untreated dirty milk, but they will also do far better if artificially fed on clean, uncooked milk than on the best kind of commercially pasteurized or sterilized milk.

Figures for ten years show that infants do not die as frequently in cold weather on dirty milk as in hot weather. Else why do they not die in January as in July? The infant will stand dirty milk and cold, and it will endure heat alone, but it will not endure dirty milk and heat together. Clean, cold milk is the great necessity for the artificially fed baby. How many cities have clean milk, milk that can be trusted as a food for infants? Do

you know of one city? How many cities have cold milk? Do you know of one? There are at least ten such cities. These are the cities that have a milk ordinance requiring milk to be delivered under 50° F.: New York, Boston, Brockton, Los Angeles, Detroit, Cleveland, Cincinnati, St. Louis, St. Paul, Minneapolis, and perhaps other cities have such an ordinance. Neither Buffalo, Syracuse nor Rochester is among them. No city in New York State but New York City. Why? How many cities are feeding milk from tuberculous cattle, feeding it to their men and women, with perhaps sufficient power to resist the disease, but feeding it as well to their infants who may grow up to become patients in the sanatoria for tuberculosis that are to be built for their reception in the future?

It is not until such questions as these have been answered by the public, and until the facts which the answers to such questions should call forth have been made known to the public that we shall improve the condition of the milk. The improvement of the milk supply depends not only upon the education of the public, but upon the education of the milk producer and the milk retailer. The milk producer should be a trained dairyman. The State should have before him as schools of reference to which he may refer a number of model farms.

All the operations of dairying should be carried on, on these farms, and should include the best method of preparing the soil, planting, gathering and housing crops, selection of cattle, the housing, storing and transportation of milk. For the further advantage of the milk producer a system of bookkeeping should be so simplified as to show the operations of such farms. If the State should establish such farms, it would be unnecessary to provide new houses and new buildings. It would be a great deal better to secure old, partly run down places with old buildings, and bring these into the highest state of efficiency so that the small milk producer could learn how to improve his own place without going to the expense of new buildings.

Even cities could well conduct model farms with new buildings in connection with the park system, where a day nursery might be conducted in the park, and where the cows might supply milk for such a nursery. For the benefit of every producer and retailer every health department should have a system of milk inspection so arranged that the premises of the producer and those of the retailer are subjected to regular, quarterly inspections and the result

of those inspections entered upon a score card in triplicate so that each record of inspection might be furnished to the health office, the producer and the retailer. Upon the score card used for the retailer all of the data should be gathered necessary to make a ready reference relating to the retailer's premises, the score of the producer's premises, the bacterial count, and a rough diagram of the milk room so that in conversing with the retailer the inspecting or licensing officer might have all the information in his hands at a time in condensed form on a single sheet.

For the further benefit of the retailer there should be in every health office a model milk room in actual operation, consisting of a steam boiler, sinks, with hot and cold water, and a sterilizing box where the retailer might see and learn how to adopt the simplest principles of cleanliness and of can and utensil sterilization to the public needs.

Then with the introduction and operation of a licensing system, the enforcement of a milk ordinance by law that should provide imprisonment for a second offense, no man should be permitted to send milk into the city until the licensing authority had been satisfied with the premises of his producer, the health of his cows, the cleanliness of all his appurtenances; that the cows had been subjected to a tuberculin test, and that the shipping facilities of the railway would insure the milk being kept cold. The retailer, too, should be compelled to show his ability to comply with the ordinances before being permitted to sell milk. These are the rules that must be lived up to if we are to protect the food of our children.

We live in a great country whose people approach the highest civilization the world has ever seen. Since the Civil war all the arts and sciences have attained the most wonderful development. Everything in this great country of ours is so new that if we pause and look out upon the achievements of our people it might almost seem as if we had been transplanted into a new world, where fairylike a new order of living had been made possible in part of the cycle of the life of man. New modes of communication at a distance, new modes of travel, the work of man manifolded by wonderful machines, new plants, the earth's products quadrupled, all these until men, women and children have become mere machines.

While we are growing new grains, grasses, fruits and vegetables, we are cultivating, weeding and protecting them. What

are we doing for our children? Are we cultivating them? Are we doing for them what the agriculturist does for grasses, fruits and flowers? Are we even in their formative state giving them decent food?

The subjects discussed before you to-night are part of a great social question. Upon the feeding and the training of our children we must depend for the stability and strength of the home and of the nation. The children of to-day are to be the parents of the future. To be strong, to be good parents they must be well fed. What are you going to do for the protection of their most necessary food? Will you leave it as it is, practically unprotected, or will you insist upon the enactment of laws for its protection, and the enforcement of the laws after they are enacted?

This is the larger view of the food of the child in its relation to the State, but as a narrower, though no less important relation of the living, robust child, to the parent, let me leave with you the thought that what you may do for your own child, you will help to do for all children; for as Guyau says: "It is in paternity alone, complete conscious paternity, that man first sounds the depths of his own heart."

(This paper was illustrated by lantern slides which added to its interest.)

V. BY THE USE OF THE SCORE CARD SYSTEM

BY ELLIS M. SANTEE, M.D.

Dairy Expert, U. S. Department of Agriculture, Washington

Publicity: The most effective weapon any health officer ever had in his warfare upon filth and disease (if judiciously used) is publicity; and the safest and most reliable medium for publication is the score card. A dairyman can always fight if you attempt to deprive him of his license — and he usually does — but when he drives up to house after house only to be told that his customers do not want any more of his milk because they have seen his sanitary score and found that his methods are bad, he usually gets very busy.

It is always best at first to publish only the higher scoring places. The poorer ones are easily picked out by their absence from the list, and most of them will mend their ways that they may appear in the next list.

It is well, also, to give notice at the time of the publication of the first list that at a certain time another score will be made and at this time all scores will be published. The slovenly dairyman cannot long withstand publicity.

The dairy score card for valuing, recording and publishing dairy conditions is being adopted by Boards of Health in cities of all sizes. It is proving invaluable to inspector, producer, vendor, consumer and Boards of Health alike.

As an Aid to Uniformity of Reports

In the past, too much reliance has had to be placed upon the personal view point of the inspector. Send three men to report upon a place according to the old methods, and one will report it good, another poor, and the other may call it bad, depending entirely upon what each is looking for.

In one city whose work has come under my personal observation, a number of dairy farmers have been driven out of business because one of its inspectors has an exalted idea of a condition too often found in the spring of the year—a great amount of manure collected in the barn yards. Now this condition counts for only 3 per cent. in the U. S. Department of Agriculture score card. A man who had gone to much expense to fit up a fine place that scored 76 after he had given up trying to produce a good

quality of milk, was refused a license and financially ruined for this reason. Neighbors who happened to have good yards but scored only from 30 to 45 were allowed to continue. An intelligent application of the score card would have corrected each of these abuses, some of which bear heavily upon the individual producer, while others are unjust to the consumer.

As an Aid to Inspectors

A score card tells the inspector what to look for, records in concise and permanent manner what he sees and learns, proves a valuable insurance against successful questioning by producers of the justice of his conclusions, and removes sources of difference between them. Thus the efficiency of the work is at least doubled.

As an Aid to the Producer

The score card shows him the requirements, the good and bad points of his establishment, acts as a medium of perfect understanding between himself and the inspector, and furnishes the best producer a means of getting a just reward for his efforts to produce a good article. There was little incentive to the intensely practical farmer to produce a meritorious product while his neighbor was receiving the same price for a very inferior one. In one city where the price was fairly uniform, one of the best scoring dairy farms which has been getting from 12 cents to 18 cents per gallon for its milk, very soon, after the fact became known that it scored 90 points, entered into a yearly contract at 22 to 24 cents per gallon. Numerous incidents of like results might be cited.

As an Aid to the Dealer

The score card enables the vendor intelligently to select sources of supply, thereby helping the good producer who should be encouraged. The dealer can keep tab on the sources of his supply during the time of the contract, and likewise be furnished with a valid reason for any objection that he may raise in a contention with the producer.

As an Aid to the Consumer

A score card enables the consumer to comprehend the conditions surrounding the sources of his own supply without visiting the place, which is seldom done.

As an Aid to the Boards of Health

Boards of Health adopting the use of the score cards can not only keep posted as to dairies, but also as to the work of the

inspector. The card is a guarantee against partiality on the part of the inspector. The report is written and a mistake stares him in the face forever.

As a Stimulant to the Spirit of Emulation

The inevitable result of the use of the score card is the premium in price to the producer furnishing the best milk. In places where the system has been followed for any length of time the score of the average dairy increases each year, and the use of the card has been satisfactory to all concerned.

Methods Generally Adopted

After tactfully acquainting the producer with the object of his visit, and getting matters upon a mutually agreeable footing, the inspector looks over the herd with special reference to the general condition, cleanliness, and outward evidences of disease. The ones most often found are udder troubles, labored breathing, and those disturbances indicated by dullness of eyes. The stables are examined with reference to location, cleanliness, purity of air, the presence of other animals, and general arrangement for comfort and health of the cows, such as floor, bedding, light, ventilation, amount of air-space, food and water. Dust-catching ledges are scored as defects.

The milk room is inspected with reference to location, equipment, cleanliness, light, ventilation, freedom from flies, and construction of floors, ceilings and sidewalks.

The utensils are scored with reference to construction, cleanliness and care after cleaning. To get a correct estimate of the method of cleaning utensils, milking and cooling the milk without being present when the work is being done, will many times require the skill of a trial lawyer. It is usually better to ask for the description of methods than by direct questions.

After the score is completed, if each point is explained to the producer much misunderstanding may be avoided. If possible he should be made to feel satisfied with his score. The success or failure of any inspector may always be gauged by the frame of mind in which he leaves the producer, and while he should have the power to temporarily suspend a license he should seldom use it. When police work is needed a letter from the office usually bring the offender in, and a heart-to-heart talk with the Chief Inspector or the Health Officer usually has the desired effect.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
DAIRY DIVISION.

SANITARY INSPECTION OF DAIRIES.

DAIRY SCORE CARD.

Owner or lessee of farm:.....
 Town:..... State:.....
 Total No. of cows:..... No. milking:..... Quarts of milk produced daily:.....
 Product is sold at wholesale—retail. Name and address of dealer to whom shipped:.....
 Permit No. Date of inspection:, 190

	SCORE.		Remarks.
	Perfect.	Allowed.	
Cows			
Condition.....	2	.....	.....
Health: Outward appearance.....	3	.....	.....
Comfort.....	2	.....	.....
Ventilation.....	4	.....	.....
Cubic space.....	3	.....	.....
Cleanliness.....	5	.....	.....
Food.....	2	.....	.....
Water.....	4	.....	.....
Total.....	25	.....	Per cent perfect. . . .
STABLES.			
Location.....	3	.....	.....
Construction.....	5	.....	.....
Cleanliness.....	7	.....	.....
Light.....	5	.....	.....
Stable air.....	2	.....	.....
Removal of manure.....	2	.....	.....
Stable yard.....	1	.....	.....
Total.....	25	.....	Per cent perfect. . . .
MILK HOUSE AND STORAGE.			
Location.....	2	.....	.....
Construction.....	2	.....	.....
Equipment.....	3	.....	.....
Cleanliness.....	3	.....	.....
Care and cleanliness of utensils.....	5	.....	.....
Water supply for cleaning.....	5	.....	.....
Storing at low temperature.....	5	.....	.....
Total.....	25	.....	Per cent perfect. . . .
MILKING AND HANDLING MILK.			
Cleanliness of milking.....	10	.....	.....
Prompt and efficient cooling.....	10	.....	.....
Protection during transportation.....	5	.....	.....
Total.....	25	.....	Per cent perfect. . . .
Total.....	100	.....

QUESTION 1. Has the herd passed the tuberculin test within a year? Yes. No.

QUESTION 2. Has the water supply been examined for contamination? Yes. No.

QUESTION 3. Is there any case of contagious disease on the farm that is not properly isolated? Yes. No.

Signed.....

Inspector.

NOTE—If conditions are so exceptionally bad in any particular as to be inadequately expressed by a score of 0 the inspector will write BAD in the column of Remarks, opposite the 0.

DIRECTIONS FOR SCORING

(Check each allowance or deduction made where amount of score is not self explanatory.)

COWS

CONDITION.—Allow 2 if in good flesh. Deduct according to conditions.

HEALTH.—Allow 3 if apparently healthy. Deduct for indications of disease.

COMFORT.—Allow 2 for good conditions. Deduct 1 for poor or no bedding and 1 if left too long in cold outside or inside of stable.

VENTILATION.—Allow 4 for good system — King or muslin curtain; 2 for windows inclining inward at top; 1 for sliding windows; and nothing for holes in ceiling.

CUBIC SPACE PER COW.—Allow 3 if 500 to 1,000 cubic feet per cow; 2 for less than 500 and over 400; 1 for less than 400 and over 300; for less than 300, 0. Deduct 1 for each 500 cubic feet over 1,000 under winter conditions.

CLEANLINESS.—Allow 5 if perfect. Deduct 1 if flanks and udders are not kept clipped, otherwise according to conditions.

FOOD.—Allow 2 if good. Deduct for anything musty or decomposed.

WATER.—Allow 4 for clean running water in trough NEAR stable and 3 for same INSIDE stable; deduct for running water DISTANT from stable according to distance; deduct 1 for still water or water pumped by hand. (Water from windmill tanks under good conditions will be considered as running water.)

STABLES

LOCATION.—Allow 3 if used for no other purpose, conveniently located, on well-drained ground, with yard protected from cold winds. Deduct 3 if horses, swine, or poultry are kept in stable. Deduct 1 if poultry are allowed in stable during day.

CONSTRUCTION.—Allow $1\frac{1}{2}$ for floor of good cement or equally good material in good condition; good wood floor 1; properly constructed gutter $\frac{1}{2}$; good stall, swinging stanchion, or good tie $\frac{1}{2}$; smooth tight ceiling $\frac{1}{2}$; ceiling proper height $\frac{1}{2}$; side walls smooth and tight $\frac{1}{2}$; convenient box stall $\frac{1}{2}$; good low-down manger $\frac{1}{2}$.

CLEANLINESS.—Allow 4 for a washed floor; 2 if well swept; and 1 if well scraped. Allow 1 for clean side walls; 1 for clean windows; and 1 for clean ceilings and ledges.

LIGHT.—Allow 5 for four square feet of unobstructed glass per stanchion or stall and evenly distributed. Deduct $\frac{1}{2}$ point for each square foot less than four; deduct 2 for uneven distribution of light, not exceeding 2 points.

STABLE AIR.—Allow 2 if free from dust and odors at time of milking. Deduct according to conditions.

REMOVAL OF MANURE.—Allow 2 if removed daily to field or to proper pit giving off no odors to stable. Deduct 1 if removed to yard and over 30 feet from stable; otherwise allow 0.

MILK HOUSE AND STORAGE

STABLE YARD.—Allow $\frac{1}{2}$ point if clean, and $\frac{1}{2}$ point if well drained.

LOCATION.—Allow 2 if conveniently located, away from hog pen, privy, or other source of contamination. Deduct 1 for no clear air space between stable and milk room.

CONSTRUCTION.—Allow 2 for tight, sound floor, walls, and ceiling, well lighted, well ventilated, and free from flies.

EQUIPMENT.—Allow 1 point for hot water or steam for cleansing utensils; $\frac{1}{2}$ point for cooler in good condition; 1 for proper narrow-top milk pail; $\frac{1}{2}$ point for general utensils properly constructed.

CLEANLINESS.—Allow 3 if interior is clean. Deduct according to conditions.

UTENSILS.—Allow 3 if clean; 2 for proper care (inverted in pure air). Otherwise, 0.

WATER SUPPLY FOR CLEANING.—Allow 5 if abundant, convenient, and pure. Deduct according to conditions.

STORAGE.—Allow 5 if stored at 50° F. or below; over 50° and not over 55° F., 4; over 55° and not over 60° F., 3; over 60° F., 0.

MILKING AND HANDLING MILK

CLEANLINESS OF MILKING.—Allow 3 for clean suits used only for milking and kept in a clean place when not in use. Allow 4 for washing udders and teats and wiping them with a clean towel; 2 if wiped with moist cloth only; 1 if wiped with clean, dry cloth; 0 if cleaning is done after milker sits down to milk or if no attention is given. Allow 2 if milking is done with clean, dry hands.

PROMPT AND EFFICIENT COOLING.—Allow 5 if cooled immediately after each cow is milked. Allow 5 if cooled to 50° F. or below; over 50° and not over 55° F., 4; over 55° and not over 60° F., 3; over 60° F., 0.

PROTECTION DURING TRANSPORTATION.—Allow 5 if iced and covered; 4 if cans are jacketed or covered with clean, wet blanket; 2 for dry blanket. If no protection, 0.

(This paper was followed by a talk by Dr. Santee, in connection with a number of lantern slides, which he showed. This talk was interesting and instructing, but would not be intelligible without the slides and, therefore, is not published.)

Dr. LE SEUR—I now think that our thanks are due to those who were most responsible for this grand Conference; thanks to Mayor Adam for his kind welcome and to Health Commissioner Wende for his appreciation and assistance, therefore, let it be

Resolved, That the health officers of the Empire State hereby express their hearty appreciation of the efforts of the Commissioner of Health of the State of New York, Dr. Eugene H. Porter, to make this Convention the largest, most interesting, instructive and useful ever held.

Resolved, That we do hereby unanimously pledge our united and enthusiastic support to the Health Department of the Empire State and to its efficient head, Dr. Eugene H. Porter.

Resolved, That the hearty thanks of the members of this Sanitary Conference are hereby tendered to his Honor, Mayor Adam and Colonel Ward, Commissioner of Public Works, to the President and Secretary of the Chamber of Commerce, to Dr. Ernest Wende, the efficient Health Commissioner of Buffalo and his staff, to Mr. Almy, Secretary of the Charity Organization Society, to the members of the medical profession in Buffalo, to Dr. Eckel and his corps of demonstrators of the Tuberculosis Exhibition, to Dr. Benjamin Wende of the Meat Inspection Department, to the gentlemen and institutions whose valuable loans added so much to the extent of the Tuberculosis Exhibition, and to all those whose masterly papers have furnished so much food for thought and valuable information during the Conference.

And Resolved, That our hearty thanks are also tendered to the newspapers of Buffalo, which have reported so faithfully and extensively the proceedings of this Conference.

All in favor say "aye."

(The vote of thanks was unanimously adopted.)

Commissioner PORTER—I have nothing else to say to this most successful Conference of health officers in the history of the State other than to remind you of next year, that we expect all of you to be with us. And now—Good luck, good fortune, and good health.

The Seventh Annual Conference of the Sanitary Officers of the State of New York adjourned *sine die* at 11 p. m.

HEALTH OFFICERS IN ATTENDANCE AT CONFERENCE

ALBANY COUNTY

Dr. I. S. Becker, Altamont.
Dr. W. O. Congdon, Clarksville.
Dr. J. R. Davidson, Bethlehem.
Dr. F. H. Hurst, Guilderland Center.
Dr. Albert Mott, Cohoes.
Dr. M. S. Reid, Coeymans.

ALLEGANY COUNTY

Dr. A. T. Bacon, Canaseraga.
Dr. C. R. Bowen, Almond.
Dr. J. W. Collier, Wellsville.
Dr. H. E. Cooley, Angelica.
Dr. Wm. Dillon, Wellsville.
Dr. G. W. Hackett, Ceres.
Dr. N. J. Hardy, Belmont.
Dr. C. F. Hoffman, Bolivar.
Dr. F. E. Howard, Friendship.
Dr. H. L. Hulett, Allentown.
Dr. O. N. Latham, Bolivar.
Dr. W. H. Loughhead, Andover.
Dr. S. B. McClure, Allegany.
Dr. V. A. Mann, Canaseraga.
Dr. Grant Norton, Belmont.
Dr. C. W. O'Donnell, Andover.
Dr. Mark Sheppard, Alfred.
Dr. T. S. Thomas, Cuba.
Dr. F. H. Van Orsdale, Belmont.
Dr. J. R. Waterman, Centerville.
Dr. Clarence Wheaton, Canaseraga.
Dr. G. H. Witter, Wellsville.

BROOME COUNTY

Dr. Chas. S. Butler, Harpursville.
Dr. E. N. Christopher, Union.
Dr. J. D. Guy, Chenango Forks.
Dr. I. A. Hix, Binghamton.
Dr. H. C. Peck, Port Dickinson.
Dr. A. H. Pellette, Whitney's Point.
Dr. Z. A. Spendley, Chenango Forks.
Dr. E. L. Teed, Lisle.

CATTARAUGUS COUNTY

Dr. J. P. Boothe, Olean.
Dr. J. C. Clark, Olean.
Dr. E. L. Fish, Ashford.
Dr. S. Z. Fisher, Randolph.

Dr. Will Gardner, Conewango.
Dr. James E. Holden, Otto.
Dr. W. B. Johnston, Ellicottville.
Dr. W. W. Jones, Dayton.
Dr. Chas. Kelly, Franklinville.
Dr. Clarence King, Machias.
Dr. F. Krehbiel, Delevan.
Dr. A. D. Lake, Perrysburg.
Dr. T. B. Loughlen, Olean.
Dr. Robert Mason, Little Valley.
Dr. R. F. Rowley, Portville.
Dr. E. M. Shaffner, Great Valley.
Dr. T. E. Spalding, Salamanca.

CAYUGA COUNTY

Dr. A. H. Brown, Auburn.
Dr. N. B. Ford, Owasco.
Dr. Frank Hoxie, Union Springs.
Dr. Frank Kenyon, Scipio.
Dr. Chas. L. Lang, Cato.
Dr. H. Strohmer, Kelloggsville.
Dr. J. H. Witbeck, Aurelius.

CHAUTAUQUA COUNTY

Dr. L. C. Baldwin, Fredonia.
Dr. A. J. Bennett, Lakewood.
Dr. Chas. S. Cleland, Charlotte.
Dr. G. E. Ellis, Dunkirk.
Dr. Wm. Follett, Sandusky.
Dr. Scott D. Gleeton, Silver Creek.
Dr. Guy Granger, Sherman.
Dr. J. J. Lenhart, Bemus Point.
Dr. D. S. Macnee, Ripley.
Dr. John J. Mahoney, Jamestown.
Dr. F. G. Osborne, Ellington.
Dr. W. J. Prish, Fredonia.
Dr. Wm. A. Putnam, Forestville.
Dr. Edgar Rood, Westfield.
Dr. O. C. Shaw, Cassadaga.
Dr. A. F. Soch, Fredonia.
Dr. C. W. Southworth, Forestville.
Dr. Walter Stuart, Westfield.

CHENANGO COUNTY

Dr. L. C. Andrews, Pitcher.
Dr. W. Lee Dodge, Afton.

Dr. H. C. Lyman, Sherburne.
Dr. Jas. B. Noyes, New Berlin.

CLINTON COUNTY.

Dr. Gilbert D. Dare, Cadyville.
Dr. J. H. La Rocque, Plattsburgh.
Dr. J. B. Ransom, Dannemora.
Dr. W. U. Taylor, Mooers.

COLUMBIA COUNTY

Dr. Z. F. Dunning, Philmont.
Dr. P. R. Flanagan, West Lebanon.
Dr. Jas. W. King, Stottville.
Dr. Chas. E. O'Neil, New Lebanon.
Dr. Rensselaer Platner, Germantown.
Dr. Louis Van Hoesen, Hudson.

CORTLAND COUNTY

Dr. Geo. D. Bradford, Homer.
Dr. E. A. Didama, Cortland.
Dr. Henry Field, Marathon.
Dr. M. L. Halbert, Cincinnatus.
Dr. John E. Leonard, Harford Mills.
Dr. Bert R. Parsons, Marathon.
Dr. J. W. Whitney, Homer.

DELAWARE COUNTY

Dr. C. S. Allaben, Margaretville.
Dr. O. T. Bundy, Deposit.
Dr. S. Peter Cornell, Sidney Center.
Dr. H. J. Goodrich, Delhi.
Dr. Edward A. Holmes, Downsview.
Dr. H. P. Hubbell, Stamford.
Dr. H. W. Keator, Griffins Corners.
Dr. G. T. Scott, Davenport.

DUTCHESS COUNTY

Dr. H. S. Bontecou, Matteawan.
Dr. R. H. Breed, Wappinger Falls.
Dr. R. J. Carroll, Red Hook.
Dr. J. M. Cronk, Hyde Park.
Dr. J. H. Dingman, Tivoli.
Dr. C. L. Fletcher, Dover Plains.
Dr. E. J. Hall, Mooers Mills.
Dr. Geo. Huntington, Hopewell Jet.
Dr. I. D. LeRoy, Pleasant Valley.
Dr. J. E. Moith, Fishkill-on-Hudson.
Dr. C. S. Van Etten, Rhinebeck.

ERIE COUNTY

Dr. H. L. Atwood, Collins.
Dr. E. H. Ballou, Gardenville.
Dr. F. W. Bentley, N. Tonawanda.

Dr. Abraham Berry, Clarence Center.
Dr. C. E. Bowman, Alden.
Dr. A. R. Bradbury, Grand Island.
Dr. Mark N. Brooks, Springville.
Dr. E. W. Buffum, East Aurora.
Dr. E. W. Ewell, Lancaster.
Dr. Francis E. Fronczak, Buffalo.
Dr. Wm. A. Gerber, East Aurora.
Dr. F. A. Helwig, Akron.
Dr. Geo. N. Jack, Depew.
Dr. H. W. Johnson, Gowanda.
Dr. F. H. Johnston, Farnham.
Dr. W. B. Jolls, Orchard Park.
Dr. E. W. Jones, Hamburg.
Dr. H. C. Lapp, Clarence.
Dr. G. W. McPherson, Lancaster.
Dr. John G. Miller, Lancaster.
Dr. H. A. Pierce, Blasdell.
Dr. Morris Pitcher, Sardinia.
Dr. M. B. Shaw, Eden.
Dr. B. E. Smith, Angola.
Dr. F. H. Stanbro, Springville.
Dr. H. P. Trull, Williamsville.
Dr. W. M. Ward, North Collins.
Dr. Ernest Wende, Buffalo.
Dr. J. D. Wooster, Wales.

ESSEX COUNTY.

Dr. G. H. Beers, Ticonderoga.
Dr. Albert H. Garvin, Raybrook.
Dr. F. M. Noble, St. Armand.
Dr. F. E. Sweatt, Essex.
Dr. C. B. Warner, Port Henry.
Dr. T. A. Wasson, Elizabethtown.

FRANKLIN COUNTY

Dr. D. E. Moody, Dickinson Center.
Dr. F. M. Noble, Bloomingdale.
Dr. Chas. C. Trembley, Saranac Lake.
Dr. Chas. F. Wicker, Saranac Lake.
Dr. S. D. Williamson, Malone.

FULTON COUNTY

Dr. John Edwards, Gloversville.
Dr. H. C. Finch, Broadalbin.
Dr. G. B. Ingalls, Mayfield.
Dr. John F. Kean, Gloversville.
Dr. D. E. Lake, Fulton.

GENESEE COUNTY

Dr. Robert M. Andrews, Bergen.
Dr. J. W. Baker, Batavia.

Dr. W. O. Burbank, Pavilion.
Dr. Henry E. Gainard, Stafford.
Dr. E. E. Hummel, Darien Center.
Dr. A. P. Jackson, Oakfield.
Dr. John W. LeSeur, Batavia.
Dr. W. A. Macpherson, LeRoy.
Dr. M. P. Messinger, Oakfield.
Dr. J. B. Miller, Alexander.
Dr. A. Prince, Byron.
Dr. S. W. Skinner, LeRoy.
Dr. E. C. Smith, Corfu.
Dr. W. E. Whitcombe, Batavia.

GREENE COUNTY

Dr. George Conkling, Durham.
Dr. George Haner, Tannersville.
Dr. Stanley Vincent, Catskill.
Dr. Chas. E. Willard, Catskill.

HAMILTON COUNTY

Dr. Thomas McGann, Wells.
Dr. Fred Stevenson, Indian Lake.

HERKIMER COUNTY

Dr. Chas. H. Glidden, Little Falls.
Dr. Cyrus Kay, Herkimer.
Dr. Adam Miller, Jordanville.

JEFFERSON COUNTY

Dr. W. W. Carleton, Waterloo.
Dr. J. D. Cole, Alexandria Bay.
Dr. E. M. Crabb, Cape Vincent.
Dr. J. T. Fowkes, La Fargeville.
Dr. L. E. Gardner, Black River.
Dr. C. J. Hull, West Carthage.
Dr. J. E. Jones, Evans Mills.
Dr. A. L. Morgan, Dexter.
Dr. D. C. Rodenhurst, Philadelphia.

LEWIS COUNTY

Dr. Geo. H. Littlefield, Glenfield.
Dr. F. M. Rongrose, Constableville.
Dr. J. W. Short, Redfield.
Dr. I. D. Spencer, Croghan.
Dr. P. H. Von Zierolshofen, Croghan.

LIVINGSTON COUNTY

Dr. C. M. Fiero, Leicester.
Dr. D. H. Foster, Scottsburg.
Dr. W. K. McGowan, Conesus.
Dr. J. A. MacKenzie, Lima.
Dr. Robert Rae, Portageville.
Dr. A. V. Watkins, West Sparta.

MADISON COUNTY.

Dr. J. R. Eaton, Chittenango.
Dr. A. J. Forward, Madison.
Dr. C. E. White, Erieville.
Dr. G. W. Willcox, Hamilton.

MONROE COUNTY

Dr. J. M. Allen, East Rochester.
Dr. E. R. Armstrong, Irondequoit.
Dr. A. W. Bellamy, Irondequoit.
Dr. P. D. Carpenter, Pittsford.
Dr. R. E. Cochrane, Penfield.
Dr. W. H. De La Mater, Minaville.
Dr. John L. Hazen, Brockport.
Dr. S. J. Hermance, Clarkson.
Dr. M. E. Leary, Rochester.
Dr. A. P. Maine, Webster.
Dr. H. J. Mann, Brockport.
Dr. Joseph Pease, Hamlin.
Dr. E. B. Pratt, Fairport.
Dr. William Stanton, Webster.
Dr. M. D. Van Horn, Churchville.

MONTGOMERY COUNTY

Dr. H. R. Biggar, Glen.
Dr. E. F. Bronk, Amsterdam.
Dr. R. G. Johnson, Amsterdam.
Dr. C. C. Vedder, St. Johnsville.

NASSAU COUNTY

Dr. Joseph H. Bogart, Roslyn.
Dr. Wm. J. Burns, Sea Cliff.
Dr. A. D. Jaques, Lynbrook.
Dr. W. R. Rhame, Hempstead.
Dr. H. G. Wahlig, Sea Cliff.
Dr. H. Luther Weeks, Hempstead.

NIAGARA COUNTY.

Dr. C. R. Clarke, Ransomville.
Dr. H. L. Draper, Wilson.
Dr. J. W. Duncan, Lockport.
Dr. H. R. S. Emes, Lewiston.
Dr. J. E. Helwig, Martinsville.
Dr. W. Q. Huggins, Sanborn.
Dr. F. N. C. Jerauld, Niagara Falls.
Dr. J. M. Bickford, Lockport.
Dr. Edwin Shoemaker, Newfane.
Dr. F. A. Watters, Lockport.
Dr. H. A. Wilmot, Middleport.

ONEIDA COUNTY

Dr. T. H. Cox, Lee Center.
Dr. W. W. Jones, Rome.

Dr. C. F. Nichols, Vienna.
 Dr. Wm. D. Peckham, Utica.
 Dr. G. J. Pollard, Oriskany Falls.
 Dr. W. C. Roser, Boonville.
 Dr. W. D. Russell, New Hartford.
 Dr. E. M. Sparks, Remsen.
 Dr. James H. Whaley, Rome.
 Dr. R. B. Wilson, Vernon.

ONONDAGA COUNTY

Dr. G. L. Brown, Euclid.
 Dr. J. W. Browne, Skaneateles.
 Dr. B. F. Chase, East Syracuse.
 Dr. F. R. Coe, Warner.
 Dr. S. Ellis Crane, Onondaga Valley.
 Dr. M. E. Gregg, Eldridge.
 Dr. E. B. Merwin, Manlius.
 Dr. H. L. Merwin, Cicero.
 Dr. A. B. Rood, Minoa.
 Dr. J. N. F. Selick, Syracuse.
 Dr. F. P. Sinclair, Lysander.
 Dr. D. M. Totman, Syracuse.
 Dr. R. A. Whitney, Liverpool.
 Dr. J. R. Young, Salina.

ONTARIO COUNTY

Dr. A. D. Allen, Gorham.
 Dr. A. Eiseline, Shortsville.
 Dr. O. J. Hallenbeck, Canandaigua.
 Dr. C. D. McCarthy, Geneva.
 Dr. G. S. Means, Geneva.
 Dr. J. H. Pratt, Manchester.
 Dr. F. D. Vanderhoof, Phelps.
 Dr. S. R. Wheeler, East Bloomfield.

ORANGE COUNTY.

Dr. J. C. Hanmer, Middletown.
 Dr. B. J. Leahy, Port Jervis.
 Dr. E. A. Nugent, Minisink.
 Dr. E. M. Schultz, Middletown.
 Dr. W. H. Snyder, Newburgh.
 Dr. M. C. Whitehead, Walden.
 Dr. Russell Wiggins, Middletown.
 Dr. Theodore Writer, Mt. Hope.

ORLEANS COUNTY

Dr. H. M. Burritt, Kendall.
 Dr. D. E. Fraser, Lyndonville.
 Dr. F. H. Lattin, Gaines.
 Dr. C. E. Padelford, Clarendon.
 Dr. Geo. F. Rogan, Medina.
 Dr. F. E. Sherwood, Albion.

OSWEGO COUNTY

Dr. W. G. Babcock, Constantia.
 Dr. E. W. Crispell, Williamstown.
 Dr. Joseph Pero, Amboy.
 Dr. L. D. Pulsifer, Mexico.
 Dr. Robert Simpson, Jr., Volney.

OTSEGO COUNTY

Dr. W. S. Cooke, Otego.
 Dr. W. R. Lough, Edmeston.
 Dr. J. W. Swanson, Springfield Center.
 Dr. C. W. Walling, Oneonta.
 Dr. H. G. Willse, Richfield Springs.

PUTNAM COUNTY

Dr. John A. Holland, Cold Spring.

RENSSELAER COUNTY

Dr. W. L. Clark, Hoosick.
 Dr. I. M. Garrison, East Greenbush.
 Dr. W. B. Hutton, Valley Falls.
 Dr. G. R. Little, Schaghticoke.
 Dr. J. C. Shaw, Hoosick Falls.

ROCKLAND COUNTY

Dr. L. L. Gillett, Suffern.
 Dr. E. B. Laird, Haverstraw.
 Dr. G. A. Leitner, Orangetown.
 Dr. F. E. Pagett, Spring Valley.

ST. LAWRENCE COUNTY.

Dr. F. D. Allen, Richville.
 Dr. E. M. Cole, De Kalb Junction.
 Dr. F. E. Graves, Morristown.
 Dr. E. H. Hackett, Massena.
 Dr. L. A. Hurlburt, Fine.
 Dr. David Kellock, Harrisville.
 Dr. F. H. Ladd, Pierrepont.
 Dr. R. J. Taylor, Spragueville.
 Dr. W. E. Whitford, DePeyster.
 Dr. F. F. Williams, Canton.

SARATOGA COUNTY

Dr. T. E. Bullard, Schuylerville.
 Dr. M. M. Dolan, So. Glens Falls.
 Dr. S. S. Kathan, Conklingville.
 Dr. W. A. Patterson, Gansevoort.
 Dr. Chas. S. Prest, Waterford.
 Dr. Geo. P. H. Taylor, Stillwater.
 Dr. W. B. Webster, Schuylerville.

SCHENECTADY COUNTY

Dr. Chas. C. Duryee, Schenectady.
 Dr. C. W. Ensign, Rotterdam Junc.

Dr. F. A. Smith, Corinth.
Dr. W. L. Wilson, Scotia.

SCHOHARIE COUNTY

Dr. E. E. Billings, Gilboa.
Dr. C. K. Frazier, Cobleskill.
Dr. R. Hubbell, Jefferson.
Dr. M. D. Lipes, Cobleskill.
Dr. E. R. Persons, Gilboa.
Dr. J. M. Tibbitts, West Fulton.

SENECA COUNTY

Dr. J. S. Carman, Lodi.
Dr. D. F. Everts, Romulus.
Dr. A. J. Frantz, Caroga.
Dr. Howard Fullmer, Waterloo.
Dr. W. T. Jones, Alpine.
Dr. A. Letellier, Seneca Falls.
Dr. E. P. McWayne, Fayette.
Dr. J. E. Medden, Seneca Falls.
Dr. F. W. Severn, Interlaken.
Dr. W. M. Stacey, Tyre.

STEUBEN COUNTY

Dr. P. L. Alden, Hammondsport.
Dr. T. O. Burleson, Bath.
Dr. E. W. Bryan, Corning.
Dr. C. A. Carr, Corning.
Dr. John M. Crane, Addison.
Dr. M. E. Flynn, Addison.
Dr. I. L. Goff, Howard.
Dr. Chas. O. Green, Hornell.
Dr. J. T. Horton, Hammondsport.
Dr. L. E. Horton, Avoca.
Dr. G. M. Peabody, Wayland.
Dr. G. L. Preston, Canisteo.
Dr. J. N. Shumway, Painted Post.
Dr. W. W. Smith, Avoca.

SUFFOLK COUNTY

Dr. C. A. Baker, Yaphank.
Dr. W. A. Baker, Islip.
Dr. W. B. Gibson, Huntington.
Dr. Hugh Halsey, Southampton.
Dr. G. A. Miller, East Hampton.
Dr. Frank Overton, Patchogue.
Dr. G. H. Turrell, Smithtown Branch.

SULLIVAN COUNTY

Dr. J. A. Munson, Woodbourne.
Dr. Chas. S. Payne, Liberty.
Dr. W. J. Steele, Mongaup Valley.

TIOGA COUNTY

Dr. W. Z. Ayer, Owego.
Dr. G. S. Carpenter, Waverly.
Dr. C. W. Chidester, Newark Valley.
Dr. R. D. Eastman, Berkshire.
Dr. R. S. Harnden, Waverly.
Dr. A. W. Post, Tioga Center.

TOMPKINS COUNTY

Dr. H. H. Crum, Ithaca.
Dr. C. H. Gallagher, Slaterville
Springs.
Dr. A. C. Knapp, Dryden.
Dr. J. R. Selover, Trumansburg.
Dr. W. A. Smith, Newfield.

ULSTER COUNTY

Dr. J. M. Bowman, Shawangunk.
Dr. C. V. Haebrouck, Rosendale.
Dr. David Mosher, Marlboro.
Dr. W. B. Scott, Kingston.

WARREN COUNTY

Dr. J. A. Bean, Lake George.
Dr. D. M. Hall, Glens Falls.
Dr. G. R. Thompson, Luzerne.

WASHINGTON COUNTY

Dr. K. D. Blackfan, Cambridge.
Dr. R. A. Heenan, Sandy Hill.
Dr. A. C. Hodgman, Fort Edward.
Dr. W. A. Leonard, Shushan.
Dr. C. McKenzie, Granville.
Dr. John Millington, Greenwich.
Dr. O. H. Mott, Fort Edward.
Dr. J. A. Rich, Greenwich.
Dr. D. Rogers, Granville.
Dr. G. M. Stillman, Argyle.

WAYNE COUNTY

Dr. J. S. Brandt, Ontario Center.
Dr. J. P. Gilbert, Lyons.
Dr. W. H. Jessup, Newark.
Dr. G. A. Jones, Huron.
Dr. Robert Morris, Lincoln.
Dr. W. H. Sweeting, Savannah.
Dr. John Van Doorn, Marion.
Dr. F. L. Willson, Sodus Point.

WESTCHESTER COUNTY

Dr. A. T. Banning, Mt. Vernon.
Dr. C. E. Birch, White Plains.

